Gov. Doc. Ont L
Ontario - Legislative Assembly

SESSIONAL PAPERS.

VOL. XXVI.—PART VII.

FOURTH SESSION, SEVENTH LEGISLATURE

OF THE

PROVINCE OF ONTARIO.

SESSION 1894.

34609
16/8/94

TORONTO:
PRINTED FOR LUD. K. CAMERON, QUEEN'S PRINTER
BY WARWICK BROS & RUTTER, 68 AND 70 FRONT STREET WEST.
1894.

LIST OF SESSIONAL PAPERS

ARRANGED ALPHABETICALLY.

TITLE.	No.	REMARKS.
Accounts, Public	1	*Printed.*
Agricultural and Arts Board, grant to	113	*Not printed.*
Agricultural and Arts, Report	39	*Printed.*
Agricultural College, Report	32	"
do Report of Commission	33	"
do Commission and Evidence	124	*Not printed.*
do Cattle sale at	95	*Printed.*
do do names of cattle	97	*Not printed.*
Agricultural Societies, Analysis	103	"
Algonquin Park, Reports	22	*Printed.*
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Asylums, Report	26	*Printed.*
Awrey, N., Report on Chicago Exposition	98	"
Bee-Keepers' Association, Report	38	*Printed.*
Binder twine industry	80	"
Births, Marriages and Deaths, Report	11	"
Blind Institute, Report	30	"
Bonds and Securities	69	*Not printed.*
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Canadian Institute, Report	10	*Printed.*
Central Farmers' Institute, Report	36	"
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Children Neglected, Report	47	"
City and County Clerks, salaries	109	"
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Colonization Roads in Smith	83	*Not printed.*
Columbian Exposition, Report	98	*Printed.*
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Commutation allowances	52	"

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County Councils, Reeves comprising in 1887 and 1892..	55	*Printed.*
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Crown Lands, Report.....	14	"
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Dairymen and Creameries, Report	34	*Printed.*
Davidson liquor license	91	*Not printed.*
Deaf and Dumb Institute, Report	31	*Printed.*
Disputed Territory, number of acres sold in, etc.... ...	119	"
Division Courts, Report.....	16	"
do Rules, etc	118	*Not printed.*
Division Courts, fees of Clerks of.....	100	*Printed.*
Dorian charges against P. H. Bryce.....	127	*Not printed.*
Dufferin Registrar, fees for 1893	90	"
do do 1890-91.....	129	"
East Northumberland Registry Office, expenditures	96	*Printed.*
Education, Report	3	"
do Report of Commissioners in Prescott	4	"
do publication of book on Physiology	66	*Not printed.*
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Elgin House of Industry, Report	71	*Not printed.*
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Elgin License Commissioners.....	86	*Printed.*
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Factories Inspectors, Report	42	*Printed.*
Farmers' Institutes, Report	36	"
Fees enquiry, Commission	88	"
Fish and Game, Report	17	"
Free Libraries and Mechanics' Institutes.....	125	*Not printed.*
French language in Prescott and Russell.....	4	*Printed.*
Fruit-Growers' Association, Report	37	"
Game and Fish, Report	17	*Printed.*
Game Laws, correspondence	63	*Not printed.*
Gaols, Prisons and Reformatories, Report	27	*Printed.*
Goderich Police Magistrate.....	126	*Not printed.*
Government employees	43, 99	*Printed.*

TITLE.	No.	REMARKS.
Hamilton Beach lease	82	*Not printed.*
Hamilton, working of license law	78	*Printed.*
Hastings, Grand Jury Indictments in	60	*Not printed.*
Health Report	12	*Printed.*
Hospitals, Report	29	"
Immigration, Report	15	*Printed.*
Industries, Bureau of, Report	44	"
Inquests on vagrants	105	*Not printed.*
Insurance, Report	13	*Printed.*
do conditions of Fire policies	56	*Not printed.*
do Life Companies in Ontario	61	*Printed.*
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Librarian, Report	48	*Not printed.*
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do Commissioners, resignations	57	"
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do Commissioners in Elgin	86	*Printed.*
do to M. H. M. Davidson	91	*Not printed.*
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Magdalen Asylums, Report	28	*Printed.*
Maguire, F., appointment	120	*Not printed*
Maton inquest	110	"
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Mines, Report	21	*Printed.*
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Parliament Buildings, Waite correspondence	76	*Printed.*
Plebiscite Vote	70	"
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Queen Victoria Niagara Falls Park, Report	23	*Printed.*
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Refuge, Orphan and Magdalen Asylums	28	"
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Scott, liquor license	59	*Not printed.*
Secretary and Registrar, Report	18	*Printed.*
Sheep and Swine Breeders', Report	41	"
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Statute distribution	49	"
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Timber dues by A. McLaren	64	*Not printed*
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TITLE.	No.	REMARKS.
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LIST OF SESSIONAL PAPERS.

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No. 1.. Public Accounts of the Province for the year 1893. Presented to the Legislature, 27th February, 1894. *Printed.*

No. 2.. Estimates for the service of the Province until the Estimates of the year are finally passed. Presented to the Legislature, 16th February, 1894. *Not printed.* Estimates for the year 1894. Presented to the Legislature, 28th February, 1894. *Printed.* Estimates required for the service of the Province until the Estimates for the year are finally passed. Presented to the Legislature, 3rd April, 1894. *Not printed.* Estimates (Supplementary) for the year 1894. Presented to the Legislature, 27th April and 1st May, 1894. *Printed.*

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No. 3.. Report of the Minister of Education for the year 1893 with the statistics of 1892. Presented to the Legislature, 6th March, 1894. *Printed.*

No. 4.. Report of the Commissioners on Schools in the Counties of Prescott and Russell, in which the French language is taught. Presented to the Legislature, 16th February, 1894. *Printed.*

No. 5.. Report of the Upper Canada College for the year ending 30th June, 1893. Presented to the Legislature, 19th February, 1894. *Printed.*

No. 6.. Return to an Order of the House of the first day of April, 1892, for a Return shewing the number of Royal Commissions issued since Confederation, together with the date of the issue thereof, subjects inquired into, costs of each with names of Commissioners and amounts paid to each. Presented to the Legislature, 23rd February, 1894. Mr. *Marter.* *Printed.*

No. 7.. Report of the Toronto University for the year 1892-93. Presented to the Legislature, 16th February, 1894. *Not printed.*

No. 8.. Report of the Standing Committee on Finance, of the Toronto University, on the income and expenditure, 1893-94, of the Medical Faculty. Presented to the Legislature, 16th February, 1894. *Printed.*

No. 9.. Report of the Standing Committee of the University of Toronto, on Finance, for the year 1893-94. Presented to the Legislature, 16th February, 1894. *Printed.*

No. 10.. Report of the Canadian Institute for the year 1893. Presented to the Legislature, 3rd April, 1894. *Printed.*

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No. 11.. Report relating to the registration of Births, Marriages and Deaths for the year 1892. Presented to the Legislature, 15th March, 1894. *Printed.*

No. 12. Report of the Provincial Board of Health for the year 1893. Presented to the Legislature, 24th April, 1894. *Printed.*

No. 13.. Report of the Inspector of Insurance and Registrar of Friendly Societies for the year 1893. Presented to the Legislature, 16th February, 1894. *Printed.*

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No. 14.. Report of the Commissioner of Crown Lands for the year 1893. Presented to the Legislature, 14th March, 1894. *Printed.*

No. 15.. Report of the Department of Immigration for the year 1893. Presented to the Legislature, 15th March, 1894. *Printed.*

No. 16.. Report of the Inspector of Division Courts for the year 1893. Presented to the Legislature, 5th March, 1894. *Printed.*

No. 17.. Report of the Ontario Fish and Game Commission for the year 1893. Presented to the Legislature, 5th March, 1894. *Printed.*

No. 18.. Report of the Secretary and Registrar of the Province, for the year 1893. Presented to the Legislature, 19th April, 1894. *Printed.*

No. 19.. Report on the working of the Tavern and Shop License Acts, for the year 1893. Presented to the Legislature, 16th February, 1894. *Printed.*

No. 20.. Report of the Commissioner of Public Works for the year 1893. Presented to the Legislature, 7th March, 1894. *Printed.*

No. 21.. Report of the Bureau of Mines. Presented to the Legislature, 27th April, 1894. *Printed.*

No. 22.. Reports on the Algonquin National Park of Ontario, for the year 1893. Presented to the Legislature, 27th April, 1894. *Printed.*

No. 23.. Report of the Commissioners of the Queen Victoria Niagara Falls Park. for the year 1893. Presented to the Legislature, 26th March, 1894, *Printed.*

No. 24.. Report of the Inspector of Legal Offices for the year 1893. Presented to the Legislature, 28th March, 1894. *Printed.*

No. 25.. Report of the Master of Titles for the year 1893. Presented to the Legislature, 2nd April, 1894. *Printed.*

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No. 26.. Report upon the Lunatic and Idiot Asylums of the Province, for the year ending 30th September, 1893. Presented to the Legislature, 16th February, 1894. *Printed.*

No. 27.. Report upon the Common Gaols, Prisons and Reformatories of the Province, for the year ending 30th September, 1893. Presented to the Legislature, 3rd April, 1894. *Printed.*

No. 28.. Report upon the Houses of Refuge and Orphan and Magdalen Asylums of the Province, for the year ending 30th September, 1893. Presented to the Legislature, 16th February, 1894. *Printed.*

No. 29.. Report upon the Hospitals of the Province, for the year ending 30th September, 1893. Presented to the Legislature, 23rd February, 1894. *Printed.*

No. 30.. Report upon the Ontario Institution for the education of the Blind at Brantford, for the year ending 30th September, 1893. Presented to the Legislature, 16th February, 1894. *Printed.*

No. 31.. Report upon the Ontario Institution for the education of the Deaf and Dumb at Belleville, for the year ending 30th September, 1893. Presented to the Legislature, 16th February, 1894. *Printed.*

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No. 32. Report of the Ontario Agricultural College and of the Agricultural and Experimental Union, for the year 1893. Presented to the Legislature, 27th February, 1894. *Printed.*

No. 33.. Report of the Commission of Enquiry as to the Ontario Agricultural College and Experimental Farm. Presented to the Legislature, 3rd April, 1894. *Printed.*

No. 34.. Reports of the Dairymen's and Creameries' Association of Ontario, for the year 1893. Presented to the Legislature, 20th April, 1894. *Printed.*

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No. 35.. Report of the Entomological Society for the year 1893. Presented to the Legislature, 16th February, 1894. *Printed.*

No. 36.. Report of the Farmers' Institutes for the year 1893. Presented to the Legislature, 17th April, 1894. *Printed.*

No. 37.. Report of the Fruit-Growers' Association of Ontario, for the year 1893. Presented to the Legislature, 20th April, 1894. *Printed.*

No. 38.. Report of the Bee-Keepers' Association of Ontario, for the year 1893. Presented to the Legislature, 14th March, 1894. *Printed.*

No. 39.. Report of the Agriculture and Arts Association, for the year 1893. Presented to the Legislature, 2nd March, 1894. *Printed.*

No. 40.. Report of the Poultry Association of Ontario, for the year 1893. Presented to the Legislature, 2nd March, 1894. *Printed.*

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No. 41.. Report of the Sheep and Swine Breeders' Association of Ontario, for the year 1893. Presented to the Legislature, 17th April, 1894. *Printed.*

No. 42.. Report of the Inspectors of Factories for the year 1893. Presented to the Legislature, 19th March, 1894. *Printed.*

No. 43.. Return to Orders of the House of the tenth day of April and nineteenth day of May, 1893, and of the twenty-sixth day of February, 1894, respectively, for a Return of the names of all persons who, during the year 1871, held office under the Crown or were employed in, or in connection with any Department or branch of the Public Service, to whom or in respect of whose office or employment any salary or remuneration was paid out of the Consolidated Revenue Fund, or any special Fund applicable for the purpose, or by fees or otherwise, and whether the office or employment was permanent or temporary, together with a statement of the salary or remuneration attached to or payable in respect of each such office or employment, and the amount paid in the said year to each of such persons, and the date when each permanent office was created, and for a like Return for the year 1892; the several branches of the Public Services to which such Return relates to be classified therein as nearly as practicable as the same are classified in the Public Accounts. And a Return shewing in addition to, and as part of the Return, relating to the Public Service, ordered by the House on the tenth day of April last, the number of the letters written from each of the Departments of the Government of the Province during the years 1871 and 1892 respectively, relating exclusively to the Public Service, and distinguishing, as far as practicable, those written by the different branches of each Department. And giving also a statement from each of the Departments shewing comparatively the volume of business done in each Department during the said years 1871 and 1892, such statement to classify, so far as practicable, the business under general heads, and to set out the causes of increase or decrease under each head, and to specify the branches of the Public Service and the additions thereto, which have come into existence since the year 1871. And a Return shewing in addition to the information for the years 1871 and 1892, like information for the year 1873. Presented to the Legislature, 3rd April, 1894. Messieurs *Meredith*, *Davis* and *Balfour*. *Printed.*

No. 44 .. Report of the Bureau of Industries for the Province, for the year 1893. Presented to the Legislature, 17th April, 1894. *Printed.*

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No. 44 .. Report of the Bureau of Industries for the Province, for the year 1893. Presented to the Legislature, 17th April, 1894. *Printed.*

No. 45 .. Report on the Tenders for Departmental and Legislative Printing and Binding, with contract with Warwick Bros. and Rutter. Presented to the Legislature, 16th February, 1894. *Printed.*

No. 46 .. Return from the Records of the several Elections to the Legislative Assembly, in the Electoral Districts of the North Riding of the County of Bruce; the East Riding of the County of Lambton, and the South Riding of the County of Lanark, since the General Election of 1890, shewing (1) the number of Votes polled for each Candidate in each Electoral District; (2) the majority whereby each successful candidate was returned; (3) the total number of Votes polled in each District; (4) the number of Votes remaining unpolled; (5) the number of names on the Voters' List in each District; (6) the number of Ballot Papers sent out and how disposed of in each Polling Sub-division; (7) the number of Tendered Ballots sent out; (8) the population of each District as shewn by the Census. Presented to the Legislature, 14th February and 9th March, 1894. *Printed.*

No. 47 .. Report of work under the Neglected Children's Protection Act for the six months ending 31st December, 1893. Presented to the Legislature, 16th February, 1894. *Printed.*

No. 48 .. Report of the Librarian on the state of the Library. Presented to the Legislature, 16th February, 1894. *Not printed.*

No. 49 .. Statement as to the disposal of the Revised Statutes, 1887, for the year 1893. Presented to the Legislature, 16th February, 1894. *Not printed.*

No. 50 .. Statement as to the disposal of the Sessional Statutes for the year 1893. Presented to the Legislature, 16th February, 1894 *Not printed.*

No. 51 .. Return to an Order of the House of the twenty-fourth day of April, 1893, for a Return, giving the report of the Committee of the Senate of the University of Toronto appointed to enquire into the erection of the Biological Buildings, with the evidence upon which the said report is based; also, copies of all correspondence with the Government regarding the proposed Park Hospital, and all papers relating to the said Park Hospital, and all reports of any action taken in regard to the said Park Hospital scheme, or regarding any action which may have been or may be in contemplation by the Senate of the University of Toronto, the University Trustees or the Park Hospital Trustees; in connection with the lots leased to the Park Hospital Trustees; also copies of any correspondence with the Government having reference to matters bearing upon Medical Education in Ontario and the relation of the University of Toronto thereto. Presented to the Legislature, 19th February, 1894. Mr. *Preston.* *Printed.*

No. 52 .. Return to an Address to His Honour the Lieutenant-Governor, of the twenty-eighth day of April, 1893, praying that he will cause to be laid before the House a Return, shewing as to what offices, or services, Orders in Council have been passed commuting the fees; the date of the Orders in Council; the amount of the commutation allowances, with a schedule or table shewing the amounts paid to each official in each year since the Order in Council was passed, and the amount received by the Province in each year from the fees of his office. Presented to the Legislature, 16th February, 1894. Mr. *Hudson*. *Printed*.

No. 53 .. Supplementary Return to an Order of the House of the eleventh day of April, 1892, for a Return shewing by townships the amount remaining unpaid on the 31st December last on lands sold, of (1) Crown Lands, (2) Common School Lands, (3) Grammar School Lands, (4) Railway Lands, and the aggregate amount due in respect of each of the said classes of lands distinguishing the amounts due for principal and interest respectively. Presented to the Legislature, 16th February, 1894. Mr. *Meredith*. *Printed*.

No. 54 .. Return to an Order of the House of the twenty-eighth day of April, 1893, for a Return shewing the number and names of places visited in the different electoral constituencies in the Province in each of the years 1891 and 1892 by the Travelling Dairy, the number of persons forming the staff of each Dairy, the salaries paid, the travelling and other expenses incurred, and the manner in which these travelling expenses were paid. Presented to the Legislature, 16th February, 1894. Mr. *Preston*. *Not printed*.

No. 55 .. Return to an Order of the House of the fifth day of May, 1893, for a Return shewing the numbers of Reeves comprising the various County Councils of the Province in the years 1887 and 1892 respectively, together with the statement of the amount paid as indemnity and the assessment of each of the said Municipalities in each of the above mentioned years. Presented to the Legislature, 16th February, 1894. Mr. *Wood (Brant)*. *Printed*.

No. 56 .. Return to an Order of the House of the twelfth day of May, 1893, for a Return shewing as to the conditions of policies ordinarily used by fire Insurance Companies in Ontario. Firstly—Companies using policies without conditions, or with conditions less than the statutory ones. Secondly—Those using statutory conditions only. Thirdly—Those imposing additional conditions to the statutory conditions, and the nature of such conditions. Presented to the Legislature, 16th February, 1894. Mr. *Monk*. *Not printed*,

No. 57 .. Return to an Order of the House of the seventeenth day of May, 1893, for a Return shewing the number of resignations, dismissals and suspensions of License Commissioners and Inspectors for the years 1890-91 and '92. Also, copies of all papers and correspondence connected therewith, and instructions to special Agents, and names of Commissioners and Inspectors so dismissed or suspended, or who have resigned, and the causes of such resignation, dismissal or suspension. Presented to the Legislature, 16th February, 1894. Mr. *Ryerson*. *Printed*.

No. 58 .. Return to an Order of the House of the nineteenth day of May, 1893, for a Return, so far as the facts appear from the papers filed, and the books in the office at Osgoode Hall, relating to the motions and other matters heard and disposed of from first day of November, 1892, to first day of May, 1893, by or before a Judge of the High Court, sitting in Court at Osgoode Hall, in the Chancery Division, and in the Queen's Bench and Common Pleas Divisions of the High Court respectively—exclusive of trials at sittings for trials. Such Return to shew and classify as far as practicable under general heads the nature of the various motions and proceedings in Single Court. Also, shewing which of them were unopposed and which of them were disposed of upon consent of parties. Also, shewing the style in short form, of the several actions, causes and matters, and in what counties the same respectively originated. Presented to the Legislature, 16th February, 1894. Mr. *Guthrie*. *Printed*.

No. 59 .. Return to an Order of the House of the nineteenth day of May, 1893, for a Return of a copy of the application for and Petition against the granting of a Tavern or other liquor license to Mr. Scott, of the City of Windsor, together with copies of all correspondence, minutes, proceedings and papers relating thereto. Presented to the Legislature, 16th February, 1894. Mr. *White*. *Not printed*.

No. 60 .. Return to an Order of the House of the nineteenth day of May, 1893, for a Return shewing how many indictments have been placed before the Grand Jury in the County of Hastings for the last six years; in how many cases were true Bills found; how many cases were there in which the parties charged were in the County at the time of preferring the indictments; in how many cases have the persons charged been brought back under extradition or otherwise, and what has been the cost to the County of Hastings. Presented to the Legislature, 16th February, 1894. Mr. *Hudson*. *Not printed*.

No. 61 .. Return to an Order of the House of the twelfth day of May, 1893, for a Return shewing as to the names of Life Insurance Companies doing business in Ontario among the industrial classes and receiving premiums of one dollar or under, weekly, and shewing an unusual condition in the policies. Shewing also, the number and names, so far as ascertainable, of cases disputed or contested by such companies during the last two years and the amount involved. And the defences set up to such cases. Presented to the Legislature, 16th February, 1894. Mr. *Monk*. *Printed*.

No. 62 .. Return to an Order of the House of the eleventh day of March, 1892, for a Return shewing, in monthly form, the Expenditure in the Public Institutions of the Province from the year 1883 to the year 1891, both inclusive. Presented to the Legislature, 22nd February, 1894. Mr. *H. E. Clarke, (Toronto)*. *Printed*.

No. 63 .. Return to an Order of the House of the twenty-eighth day of April, 1893 for a Return of copies of all correspondence between any

member of the Government and any other person or persons respecting prosecutions under the Game Laws in the Counties of Lennox and Addington, and for copies of returns of all convictions for offences under the Game Laws in said Counties since the 1st July, 1892. Presented to the Legislature, 22nd February, 1894. Mr. *Reid*. *Not printed.*

No. 64 .. Return to an Order of the House of the twelfth day of April, 1893, for a Return shewing the amount due in the year 1889, by Alexander McLaren, for dues on timber cut on the berth in the Township of Wilberforce, of which he was licensee and of the amount accepted in payment of his indebtedness and of copies of all correspondence with reference to such indebtedness, and the settlement of it and of all reports by an officer of the Department in reference thereto, and as to the quantity of timber cut by the licensee and as to the value of the license. Presented to the Legislature, 23rd February, 1894. Mr. *Miscampbell*. *Not printed.*

No. 65 .. Report of the Inspector of Registry Offices for the year 1893, together with a statement of the Returns of the Fees and Emoluments of the Registrars of Ontario for the same year. Presented to the Legislature, 26th February, 1894. *Printed.*

No. 66 .. Copy of an Order in Council approving of an Agreement with the Methodist Book Room and Publishing House, Toronto, respecting the publication of the Public School Text Book on Physiology and Temperance. Presented to the Legislature, 26th February, 1894 *Not printed.*

No. 67 .. Copy of a Minute of the Department of Education approving of certain Regulations of the Department. Presented to the Legislature, 26th February, 1894. *Not printed.*

No. 68.. Copy of an Order in Council appointing Samuel B. Sinclair, B.A,, Vice-Principal of the Provincial Normal School at Ottawa. Presented to the Legislature, 26th February, 1894. *Not printed.*

No. 69.. Detailed Statement of all Bonds and Securities recorded in the Provincial Registrar's Office since the last Return submitted to the Legislature, and made in accordance with the provisions of R.S.O., Cap. 15, Sec. 23. Presented to the Legislature, 26th February, 1894. *Not printed.*

No. 70.. Return to an Order of the House of the twenty-seventh day of February, 1894. for a Return, from the Records of the Votes cast "yes" and "no" on the question of Prohibition on 1st January last under 56 Viet. Cap. 41, showing (1) The number of male votes polled in each Municipality; (2) The number of female votes so polled; (3) The total votes cast; (4) The male and female and total majorities; (5) The number of males and females voting; (6) The number of male and female votes on voters' lists, and number of such votes unpolled; (7) The number of spoiled and rejected ballots; and a further Return showing in detail; (8) The male votes cast in each

electoral district of the Province; (9) The majorities "yes" and "no" in each such electoral district, and the total numbers of male votes cast; (10) The total male votes on voters' lists and unpolled, and (11) A statement of votes polled at the general election for the Legislative Assembly in 1890, with the total votes on voters' lists and unpolled at such election. Presented to the Legislature, 28th February, 1894. Mr. *McKay* (*Oxford.*) *Printed.*

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No. 71.. Report of the Inspector of the House of Industry and Refuge of the County of Elgin. Presented to the Legislature, 28th February, 1894. *Not printed.*

No. 72.. Report of the Directors of the Niagara Falls Park and River Railway Company, with the Financial Statement for the year 1893. Presented to the Legislature, 28th February, 1894. *Printed.*

No. 73.. Statement of the affairs of the Toronto General Trusts Company for the year 1893. Presented to the Legislature, 1st March, 1894. *Not printed.*

No. 74.. Return to an Order of the House of the twelfth day of April, 1893, for a Return of all timber berths which have been sold or disposed of which were not under license in the year 1889, and a like Return for each of the years 1890, 1891 and 1892. Presented to the Legislature, 5th March, 1894. Mr. *Meredith.* *Printed.*

No. 75.. Return to an Order of the House of the seventh day of March, 1894, for a Return of the number of cases now standing for argument in the Court of Appeal, and the number which were standing for argument on the first days of January, 1890, 1891, 1892, 1893 and 1894. Presented to the Legislature, 13th and 26th March, 1894. Mr. *Meredith.* *Printed.*

No. 76.. Correspondence, letters and accounts in connection with the employment of Mr. R. A. Waite as Architect of the new Parliament and Departmental Buildings, and the claim made by him in respect of his services as such Architect. Presented to the Legislature, 15th March, 1894. *Printed.*

No. 77.. Contract with Messieurs Barber Bros. for the supply of Printing Paper for the five years ending 31st December, 1898. Presented to the Legislature, 19th March, 1894. *Printed.*

No. 78. Return to an Order of the House of the twenty-third day of February, 1894, for a Return of a copy of the report made to the Government in 1893, by Mr. J. K. Stewart, Provincial Inspector of Licenses, respecting the operation of the License Law in the City of Hamilton, and the accommodation provided by the places licensed in the city. Presented to the Legislature, 19th March, 1894. Mr. *Clarke* (*Toronto.*) *Printed.*

No. 79.. Return to an Order of the House of the twenty-third day of February, 1894, for a Return of copies of all correspondence and reports with regard to the application or claim of Samuel Spicknell, formerly an employee in the Insane Asylum at London, for a gratuity or allowance, on his ceasing to be employed in the Public Service of the Province. Presented to the Legislature, 19th March, 1894. Mr. *Meredith*. *Not printed.*

No. 80.. Return to an Order of the House of the seventh day of March, 1894, for a Return shewing the amounts expended in connection with the Provincial binder twine industry, (1) for buildings, (2) for machinery, (3) for materials, up to 30th September, 1893, (4) for labour and superintendence, with the names of foreman or superintendents employed and the wages or salary paid to each of them up to 30th September, 1893; and showing also, (1) the total output of twine in quantity and the amounts realized therefrom, giving the names from whom the same were received and the dates of the receipt of each sum prior to 30th September, 1893; (2) the total quantity of twine on hand; (3) the total quantity of material on hand on 30th September, 1893; (4) the amounts (if any) remaining unpaid by the purchasers, with names of the persons by whom the same are payable; (5) the names of the agents employed for the sale or disposal of the twine, and the remuneration paid or payable to each of them; (6) and a statement of the number of prisoners employed in connection with the industry and of the time during which they were employed. Presented to the Legislature, 28th March, 1894. Mr. *Preston*. *Printed.*

No. 81.. Return to an Order of the House of the twenty-eighth day of February, 1894, for a Return of copies of all correspondence in connection with an application for a supply of timber for a local saw mill in the Township of Tyendenaga, in the County of Hastings, by Mr. Fraser Chisholm, of the said township. Presented to the Legislature, 29th March, 1894. Mr. *Wood (Hastings.)* *Not printed.*

No. 82.. Return to an Order of the House of the twelfth day of March, 1894, for a Return shewing to whom the Island at Hamilton Beach is leased; the terms of the lease; the amount of annual rental; how the lease was obtained, whether by public auction or private arrangement. Presented to the Legislature, 29th March, 1894. Mr. *Ryerson*. *Not printed*

No. 83.. Return to an Order of the House of the fourteenth day of March, 1894, for a Return of all moneys paid by the Government for Colonization Roads in the Township of Smith, in the County of Peterborough for the years 1890-91-92-93. Presented to the Legislature, 29th March, 1894. Mr. *Willoughby*. *Not printed.*

No. 84.. Return to an Order of the House of the nineteenth day of March, 1894, for a Return of all convictions under the Liquor License Act in the Riding of North Ontario during the year 1893. Also, shewing all moneys paid to the License Inspector for salary and expenses during the same year, distinguishing the amounts paid for salary and the

amounts paid for expenses. Also, of the particulars of any fines which may have been remitted during the same year. Also, the gross amount of money received by the Inspector, in his official capacity, during the same year, and a detailed statement of the amounts disbursed by him during the same time, shewing to whom and for what purposes they were paid. Presented to the Legislature, 29th March, 1894. Mr. *Glendinning.* *Not printed.*

No. 85.. Return to an Order of the House of the seventh day of March, 1894, for a Return of the number of Reeves and Deputy-Reeves comprising the several County Councils of the Province for the year 1893. Presented to the Legislature, 12th April, 1894. Mr. *McKechnie.* *Printed.*

No. 86.. Return to an Order of the House of the twenty-eighth day of March 1894, for a Return giving a copy of the Report of Mr. Stewart, Provincial License Inspector, as to the charge that certain License Commissioners in the County of Elgin were owners of licensed premises, and that licenses were refused certain parties on political grounds. Presented to the Legislature, 2nd April, 1894. Mr. *McColl.* *Printed.*

No. 87.. Return to an Order of the House of the twenty-first day of March last for a Return of copies of all correspondence, commission report and all other documents and papers relating to certain charges made by Robert McDonald against Detective Thomas McKee, of the City of Windsor, and of the disposition of the matter. Presented to the Legislature, 2nd April, 1894. Mr. *White.* *Not printed.*

No. 88.. Copy of the Commission issued to the Honourable T. A. Boyd and others to enquire into and to collect and report to the Lieutenant-Governor upon the facts bearing on the various views which have been expressed with respect to the mode of remunerating and appointing certain Provincial Officials, now paid by fees, including the practice and experience of other countries. Presented to the Legislature, 5th April, 1894. *Printed.*

No. 89.. Return to an Order of the House of the twenty-eighth day of March, 1894, for a Return shewing what system of payment the Government adopted in dealing with stockmen at the Columbian Exposition. The amount each owner received for fares, maintenance, caretaking or for any other purpose, distinguishing each amount and giving the name of each owner. Presented to the Legislature, 5th April, 1894. Mr. *McKay* (*Victoria.*) *Not printed.*

No. 90.. Return to an Order of the House of the thirtieth day of March last, for a Return of a detailed statement for 1893 of all fees and emoluments of the Registrars of Deeds for the County of Dufferin in connection with his office. Presented to the Legislature, 5th April, 1894. Mr. *Barr* (*Dufferin.*) *Not printed.*

No. 91... Return to an Order of the House of the fourteenth day of March, 1894, for a Return of copies of all correspondence between Mrs. M. H. M.

Davidson and the Government, or any officer thereof, relating to her application for a license in the years 1892 and 1893, for the Albion Hotel, in the Village of Shannonville. Presented to the Legislature, 6th April, 1894. Mr. *Hudson*. *Not printed.*

No. 92 .. Return to an Order of the House of the twenty-sixth day of March, 1894, for a Return shewing amount collected on account of the Municipal Loan Fund from Confederation until 31st December, 1871. Also, collections on account of Crown, Clergy, Common School, Grammar and Mining Lands in the same period, and collections on same lands in the four years ending 31st December, 1893. Shewing, also, collections on account of Municipal Loan Fund in 1872. Presented to the Legislature, 11th April, 1894. Mr. *Gibson* (*Huron.*) *Printed.*

No. 93 .. Return to an Order of the House of the thirtieth day of March, 1894, for a Return of all convictions under the Liquor License Act in the County of Dufferin during the years 1892 and 1893. Also, of all moneys paid to the License Inspector for salary and expenses, giving the amount paid for salary and expenses separately Also, the particulars of all fines that may have been remitted. Also, the gross amount of money received by the Inspector during the said term, and a detailed statement of the amounts disbursed by him during the said time, shewing to whom and for what such disbursements were made. Presented to the Legislature, 12th April, 1894. Mr. *Barr* (*Dufferin.*) *Not printed.*

No. 94 .. Return to an Order of the House of the fourth day of April 1894, for a Return of copies of all correspondence between the Council of the County of Elgin and the Government with regard to an increased grant to the County, under the provisions of the Act respecting the establishment of Houses of Industry. Presented to the Legislature, 12th April, 1894. Mr. *McColl*. *Not printed.*

No. 95 .. Return to an Order of the House of the first day of March, 1894, for a Return shewing (1) the advertisements for the sale of the cattle offered for sale at the Agricultural College in December last; (2) the conditions of sale; (3) a list of the names of the purchasers and the prices paid for the animals sold; (4) a list of the animals of which the purchasers refused to complete the sale; (5) a statement of the animals sold and afterwards returned; (6) a list of the animals in respect of which the test for tuberculosis was applied, and statement of the result in each case. Presented to the Legislature, 13th April, 1894. Mr. *McColl*. *Printed.*

No. 96 .. Return to an Order of the House of the ninth day of March, 1894, for a Return giving an itemized statement of all expenditures and disbursements in connection with East Northumberland Registry Office for the years 1891, 1892 and 1893, shewing the number of employees, the name of each employee and the period in each year during which he or she was employed. Presented to the Legislature, 13th April, 1894. Mr. *Willoughby*. *Printed.*

No. 97 .. Return to an Order of the House of the twenty-first day of March last for a Return giving the name of the Dam of each Calf offered for sale from the Ontario Experimental Farm and Dairy in the year 1893, and where such Dam was purchased. Presented to the Legislature, 13th April, 1894. Mr. *Ryerson*. *Not printed.*

No. 98 .. Report of N. Awrey, Esquire, M.P.P., as Ontario Commissioner to the World's Columbian Exposition, 1893. Presented to the Legislature, 17th April, 1894. *Printed.*

No. 99 .. Return to an Order of the House of the twenty-sixth day of February, 1894, for a Return shewing the number of persons employed, temporarily or permanently, by the Government in the service of the Province on the 31st December, 1893, together with their names, ages, nationality, religion, salary, occupation, place of residence and date of appointment; but not including mechanics, artisans, laborers or like employees whose engagement or employment was of a merely temporary character. Also, a similar Return as to all Sessional Clerks employed during the Sessions of 1893 and 1894. Presented to the Legislature, 17th April, 1894. Mr. *Balfour*. *Printed.*

No. 100.. Return to an Order of the House of the sixteenth day of March, 1894, for a Return shewing the gross fees or emoluments of each Division Court Clerk and Bailiff in the Province for the year 1893; the net emoluments of such clerks as have paid any sum to the Provincial Treasurer in pursuance of Chapter 17, 55 Victoria, intituled, "An Act respecting the Fees of certain Public Officers." Also, the several amounts paid, or to be paid, under the provisions of the Division Courts Act, to the Provincial Treasurer in each year for the ten years ending on the 31st December, 1893. Presented to the Legislature, 17th April, 1894. Mr. *Marter*. *Printed.*

No. 101 .. Return to an Order of the House of the sixteenth day of March, 1894, for a Return giving a detailed statement of the receipts and expenditures of the Law Society of Ontario for the year 1893. Also, a statement of the assets and liabilities of the Society on the first day of January, 1894. Also, a statement shewing the objects and purposes to which the funds of the Society are applicable. Presented to the Legislature, 17th April, 1894. Mr. *Balfour*. *Printed.*

No. 102 .. Return to an Order of the House of the twenty-first day of March, 1894, for a Return of a copy of the report of His Honour the Junior Judge of the County of Essex which led to the dismissal or resignation of Aurele Pacaud, a bailiff of the 7th Division Court of the County of Essex, together with copies of all correspondence, evidence, statements, reports and other papers and documents relating to the matter. Presented to the Legislature, 17th April, 1894. Mr. *White*. *Not printed.*

No. 103.. Analysis of Reports of County and Township Agricultural and Horticultural Societies for the year 1893. Presented to the Legislature 18th April, 1894. *Not printed.*

No. 104... Return to an Order of the House of the twenty-second day of February, 1894, for a Return, duly compiled from the Census Returns for the year 1891, of the Federal Census for the Province, shewing the population for each county and district and the municipalities situate therein, the population of the unorganized territory and the Provincial Electoral Districts. Presented to the Legislature, 18th April, 1894. Mr. *Wood (Brant.)* *Printed.*

No. 105... Return to an Order of the House of the twenty-sixth day of February, 1894, for a Return shewing the number of inquests held during the past three years on the death of persons committed for vagrancy, in the gaols, prisons, houses of correction, lockups or houses of industry, and the cost in connection with the finding of such inquests. Presented to the Legislature, 18th April, 1894. Mr. *Barr (Dufferin.)* *Not printed.*

No. 106... Return to an Order of the House of the sixth day of April, 1894, for a Return from the Provincial Inspector of Registry Offices, from his memoranda made at his inspection of Registry Offices in 1892, of the last instrument received for registration in each municipality in each Registration Division; the last instrument copied in each municipality in each division, and the last instrument compared in each municipality in each division, with a like Return from the same memoranda for 1893, with the dates of the inspections in each division in each year. Presented to the Legislature, 18th April, 1894. Mr. *Wood (Hastings.)* *Printed.*

No. 107... Estimated sales for the year 1894, from the Central Prison Industries. Presented to the Legislature, 19th April, 1894. *Printed.*

No. 108... Return to an Order of the House of the twenty-eighth day of March, 1894, for a Return shewing (1) the salaries of all City and County Treasurers; (2) the total amount of all fees or other emoluments received by the Treasurers by reason of their offices. Presented to the Legislature, 19th April, 1894. Mr. *Bishop.* *Printed.*

No. 109... Return to an Order of the House of the thirtieth day of March, 1894, for a Return shewing the salaries of all City and County Clerks in the Province for the year 1893. Presented to the Legislature, 19th April, 1894. Mr. *Clancy.* *Printed.*

No. 110.. Return to an Order of the House of the fourth day of April, 1894, for a Return of copies of the evidence in the inquest on one Maton, held at the Village of Carleton on October 3rd, 1893, together with copies of all correspondence between the Coroner and the County Crown Attorney and the County Crown Attorney and the Attorney-General. Presented to the Legislature, 20th April, 1894. Mr. *Ryerson.* *Not printed.*

No. 111.. Return to an Order of the House of the ninth day of March, 1894, for a Return shewing separately, the total municipal and school expenditure of each County, Township, City, Town and Village in the Province for the years 1883 and 1893, respectively. Presented to the Legislature, 23rd April, 1894. Mr. *Balfour.* *Printed.*

No. 112.. Return to an Address to His Honour the Lieutenant-Governor of the nineteenth day of March, 1894, praying that His Honour will cause to be laid before this House a Return of a copy of the original plan shewing the location of Russell Square in the City of Toronto, and of all instructions, Orders in Council, minutes and correspondence relating to the survey or laying out of the Square. Also, of a copy of Letters Patent thereof, and of all Orders in Council, minutes and correspondence relating to the issue of such Letters Patent and relating to any subsequent disposition or appropriation of the land, and of all correspondence, petitions and documents with reference to the claim of the Corporation of the City of Toronto to said Square, and the diversion of it from the purposes for which it was originally designed. Presented to the Legislature, 23rd April, 1894. Mr. *Clarke (Toronto.)* *Printed.*

No. 113.. Return to an Order of the House of the fourteenth day of March, 1894, for a Return shewing the full amount of the Government grant to the Agricultural and Arts Board, and a detailed statement of its expenditure for the past five years. Presented to the Legislature, 23rd April, 1894. Mr. *Preston.* *Not printed.*

No. 114.. Return to an Order of the House of the fourth day of April, 1894, for a Return of copies of all correspondence in connection with the granting of a shop license for the sale of liquor to one Joseph Aspinall, of the Town of Tilsonburgh, in the South Riding of Oxford, for the years 1893-4. Also, copies of all papers and documents in possession of the Government, or any official thereof, relating to the said license, together with a copy of the Report of the Chief Inspector, who enquired into the complaint that the license was fraudulently granted. Presented to the Legislature, 23rd April, 1894. Mr. *McCleary.* *Not printed.*

No. 115.. Petition, correspondence and general information in respect of the application for grants of Public money in aid of the construction of certain portions of the Irondale, Bancroft and Ottawa, the Northern and Pacific Junction, the Ottawa, Arnprior and Parry Sound, and the Ontario and Rainy River Railways. Presented to the Legislature, 25th April, 1894. *Printed.*

No. 116.. Return to an Order of the House of the sixth day of April, 1894, for a Return from each Registration Division in Ontario, shewing all losses sustained by reason of errors or omissions on the part of officials of said divisions, with the names of parties to whom paid; dates of payment and the nature of error or omission, such Return to extend over the last ten years. Presented to the Legislature, 26th April, 1894. Mr. *Wood (Hastings.)* *Printed.*

No. 117.. Return to an Order of the House of the second day of March, 1894, for a Return from each municipality in the Province, other than Counties, showing that the rate of taxation therein (1) for municipal purposes, (2) for school purposes, (3) total. Presented to the Legislature, 26th April, 1894. Mr. *Clarke (Lanark.)* *Printed.*

No. 118.. Rules, Orders and Forms of the Division Courts of Ontario, as adopted by the Board of County Judges, 1894. Presented to the Legislature, 26th April, 1894. *Not printed.*

No. 119.. Return to an Order of the House of the nineteenth day of March, 1894, for a Return, shewing the number of acres sold by the Government in what was called the Disputed Territory, and shewing also the number of square miles of timber limits under license therein, and what has accrued by way of revenue up to the fifteenth day of March, 1894. And what has, during the same period, been expended by the Province within the said Territory. And also, what is the liability of the Province in respect of Indian Lands. Presented to the Legislature, 26th April, 1894. Mr. *Gibson (Huron.) Printed.*

No. 120.. Return to an Order of the House of the ninth day of April, 1894, for a Return shewing the date of the appointment of F. Maguire, of St. Catharines, as Inspector of immigrants at Niagara Falls, Ontario. Shewing also, what duties he performs; how many hours daily he is on duty and what salary he receives. And if he is still under pay, what allowance he receives; what are his qualificatians for the office, and if he has had any medical training. Shewing also, by whom his duties are performed during his absence; who performed similar duties before his appointment, and at what salary. Shewing also, if there are similar officials at other points on the frontier, giving name, dates of appointment and salaries. Presented to the Legislature, 26th April, 1894. Mr. *McCleary. Not printed.*

No. 121.. A compilation of the Labour Laws. Presented to the Legislature, 27th April, 1894. *Printed.*

No. 122.. Return to an Order of the House of the fifth day of March, 1894, for a Return shewing the date of the dismissal of William Young, Farm Instructor at the Reformatory for Boys at Penetanguishene. The length of time he was in the service; the cause of his dismissal; the amount paid him as a gratuity, together with the amounts, if any, paid him for rent allowance or otherwise since his dismissal. Also, copies of all correspondence between the said Young and the Government, or any officer thereof, relating to his dismissal, the payment of a gratuity or otherwise. Presented to the Legislature, 27th April, 1894. Mr. *Clancy. Not printed.*

No. 123.. Report of the Provincial Inspector into the charges preferred against J. B. White, License Inspector for the District of Manitoulin, together with a copy of the evidence taken at the investigation. Presented to the Legislature, 27th April, 1894. *Not printed.*

No. 124.. Commission, evidence and report in respect of the inquiry concerning the Agricultural College and Experimental Farm held by John Winchester, John Watterworth and John S. Pearce, Esquires. Presented to the Legislature, 27th April, 1894. *Not printed.*

No. 125. Return to an Order of the House of the twenty-third day of April, 1894, for a Return setting forth the Cities, Towns and Incorporated Villages in Ontario in which Free Libraries and Mechanics' Institutes have been established. Shewing, as well, the unincorporated Villages in which Mechanics' Institutes or reading rooms have been established, and shewing the Electoral Districts in which Farmers' Institutes have not been established. Presented to the Legislature, 27th April, 1894. Mr. *Wood (Brant.)* *Not printed.*

No. 126. Return to an Order of the House of the twentieth day of April, 1894, for a Return of copies of all correspondence and communications which have passed between the Municipal Council of the Town of Goderich, or any officer or member thereof, or any ratepayer of the said town, and any member or officer of the Government, with reference to the appointment of a Police Magistrate for the said town; and also, of all Petitions for or against the appointment. Presented to the Legislature, 27th April, 1894. Mr. *Whitney.* *Not printed.*

No. 127. Return to an Order of the House of the thirtieth day of March, 1894, for a Return of copies of all papers, letters, statements and documents in connection with the charges of G. A. Dorian, against Dr. P. H. Bryce, Secretary of the Provincial Board of Health, with a copy of the evidence adduced, and the finding of the Commissioners. Presented to the Legislature, 30th April, 1894. Mr. *Ryerson.* *Not printed.*

No. 128. Return to an Order of the House of the eighteenth day of April, 1894, for a Return shewing what amount of the Public School grant—not including the Poor Schools grant—was apportioned to cities, towns and those incorporated villages containing High Schools or Collegiate Institutes for the years 1882 and 1892 respectively, and the amount to the remaining municipalities of the Province. Presented to the Legislature, 30th April, 1894. Mr. *Meacham.* *Not printed.*

No. 129. Return to an Order of the House of the twenty-third day of April, 1894, for a Return of a detailed statement, for the years 1890 and 1891, of the fees and emoluments of the Registrar of Deeds for the County of Dufferin in connection with his office, with the dates and amounts of rebates for each year paid to the County. Presented to the Legislature, 30th April, 1894. Mr. *Barr (Dufferin.)* *Not printed.*

No. 130. Return to an Order of the House of the eighth day of May, 1893, for a Return shewing the names of all persons, firms or companies, indebted to the Province on the first day of January, 1893, on account of timber dues, ground rent or bonuses for timber limits; the amount of indebtedness in each case; the balance, if any, due by such persons, firms or companies on the first day of January, in each year since 1886, and the total amount of such indebtedness on the first day of January, 1893. Presented to the Legislature, 4th May, 1894. Mr. *Wood (Hastings.)* *Not printed.*

TWENTY-FOURTH ANNUAL REPORT

OF THE

ENTOMOLOGICAL SOCIETY

OF

ONTARIO

1893.

PRINTED BY ORDER OF THE LEGISLATIVE ASSEMBLY.

TORONTO:
PRINTED BY WARWICK BROS. & RUTTER, 68 AND 70 FRONT STREET WEST.
1894.

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REV. C. J. S. BETHUNE, M.A., D. C. L., F. R. S. C

PRESIDENT of the Entomological Society of Ontario, 1871-5; 1890-2.
VICE-PRESIDENT 1876-7, 1879, 1881, 1886-7.
EDITOR of *The Canadian Entomologist*, 1868-1873, 1886-1894.

TWENTY-FOURTH ANNUAL REPORT

OF THE

ENTOMOLOGICAL SOCIETY OF ONTARIO

To the Honorable the Minister of Agriculture :

SIR,—I have the honor to present herewith the twenty-fourth annual report of the Entomological Society of Ontario, which shows that good progress has been made in every line of work that it has undertaken. While I should not omit to refer to the maintenance of the Society's world-wide reputation as one of the leaders in Economic Entomology, it is worthy of mention that the local interest and membership of the Society shows a decided increase, proving that the methods adopted by the Society for the attainment of its ends are well suited to the purpose.

I have the honor to be, Sir,

Your obedient servant,

W. E. SAUNDERS,

Secretary.

OFFICERS FOR 1894.

President	W. H. Harrington	Ottawa
Vice-President	J. W. Dearness	London.
Secretary	W. E. Saunders	do
Treasurer	J. A. Balkwill	do

Directors :

Division No. 1	James Fletcher	Ottawa.
" 2	Rev. C. J. S Bethune	Port Hope
" 3	Gamble Geddes	Toronto.
" 4	A. H. Kilman	Ridgeway.
" 5	R. W. Rennie	London.

Librarian and Curator	J. A. Moffat	do
Auditors	J. H. Bowman	do
	J. M. Denton	do
Editor of the "Canadian Entomologist"	Rev. C. J. S. Bethune	Port Hope.
Editing Committee	J. Fletcher	Ottawa
	H. H. Lyman	Montreal.
	Rev. T. W Fyles	South Quebec.
	J. M. Denton	London.
	J. H. Bowman	do
Delegate to the Royal Society	Rev. T. W. Fyles	South Quebec.

ANNUAL MEETING OF THE SOCIETY.

The thirty-first annual meeting of the Entomological Society of Ontario was held in its rooms in Victoria Hall, London, on Wednesday and Thursday, October, 11th and 12th, 1893. In the absence of the President, the chair was occupied by Mr. J. M. DENTON, the Vice-President.

The meeting was called to order at 3 p.m., when the following members were present: Rev. T. W. Fyles, South Quebec; J. Fletcher, Ottawa; Rev. C. J. S. Bethune, Port Hope; J. M. Denton, R. Elliott, J. A. Balkwill, H. Stevenson, J. A. Moffat, R. W. Rennie, G. F. Sherwood, W. McClement, W. J. Stevenson, W. E. Saunders, London, and others. Letters of regret for their inability to attend were read from Mr. W. Hague Harrington, Ottawa, the President; Mr. H. H. Lyman, Montreal; Mr. A. H. Kilman, Ridgeway.

REPORT OF THE TREASURER.

The Treasurer, Mr. J. A. Balkwill, presented the annual statement of the finances of the Society, as follows:

RECEIPTS, 1892-93.

Balance on hand for last year	$ 319 13
Members' fees	297 51
Sales of *Entomologist*	66 07
" pins, cork, etc.	55 78
Advertisements	12 93
Government grant	1,000 00
Interest	10 64
	$1,761 16

EXPENDITURE, 1892-93.

Printing	$ 542 05
Report and meeting expenses	231 60
Library account	31 35
Purchase of collection	50 00
Expense account (postage, etc.)	63 04
Rent and fuel	40 00
Insurance	25 00
Salaries	300 00
Cork, pins, etc	10 58
Balance	457 54
	$1,761 16

We have examined the books of the Entomological Society of Ontario, compared them with vouchers and find them correct and affirm that the above statement is in accordance therewith.

(Signed) JAS. H. BOWMAN, W. E. SAUNDERS, } Auditors.

London, Ontario,
October 10th, 1893.

The Treasurer explained the various items of receipts and expenditure, and explained that the balance on hand, $457.54, though apparently larger than usual, would all be absorbed before the end of the year by the printing and other accounts, the item of $50 for the "purchase of collection" was the last instalment of the amount due to Mr. Moffat, and that this sum would be available for the benefit of the Library next year. He urged very strongly that some date should be fixed upon for the close of the Society's financial year, and that it should not depend upon the time of the annual meeting, which varied very considerably from year to year. After the Report of the Treasurer had been adopted, and a vote of thanks for his services unanimously carried, it was resolved, after some discussion, on motion of Mr Saunders, seconded by Dr. Bethune, that the financial year of the Society should in future be closed on the 31st of August, except when the annual meeting was held earlier than that date.

REPORT OF THE LIBRARIAN AND CURATOR.

Mr. J. A. Moffat presented and read his report as follows:

I beg leave to submit the following report for the year ending 31st of August, 1893: Seventy volumes have been added to the Library during the past year.

Several bound volumes were received from Governments and public institutions, the most important of which are: The Report of the New York State Museum; The Report of the Ontario Game and Fish Commission (Illustrated); The Mammals of Minnesota Illustrated); The Annual Report of the Smithsonian Institution; The 10th Volume, Proceedings and Transactions of the Royal Society of Canada; The 17th Report of the Geology and Natural History of Indiana; The Hawks and Owls of the United States (beautifully illustrated).

Those added by purchase are: Gray's Manual of Botany; Scudder's Guide to Butterflies; The Life of a Butterfly, S. H. Scudder.

The whole number now on the register is 1,284. The number of volumes issued to local members was 46.

Several interesting additions were made to the native collection of Lepidoptera. A few attractive things were added to the exotics.

A box of beetles was kindly sent to the Society by Mr. Trevor C. D. Kincaid, Olympia, Washington State, which have been placed in a drawer by themselves, and the donor's name attached.

A small but interesting and valuable collection of Rocky Mountain Butterflies has been loaned to the Society by Mr. T. B. Parkinson, one of our local members. They were taken by Dr. W. Hayden, Canmore, and presented by him to Mr. Parkinson.

Through the kind consideration of Prof. C. H. Fernald, Amherst, Mass., the Society has been put in possession of a complete life series of the Gypsy Moth, *Ocneria dispar*, Linn.

The valuable English collection had suffered severely from insect pests. By a liberal use of white crystallized napthaline, the work of destruction was at once arrested, and is now completely overcome. I find this material to be a clean, safe and certain preventive, and even a complete exterminator of insect pests.

Respectfully submitted,

J. Alston Moffat.

Librarian and Curator.

REPORT FROM THE ENTOMOLOGICAL SOCIETY OF ONTARIO TO THE ROYAL SOCIETY OF CANADA.

By W. Hague Harrington, Delegate.

I have the honor, as duly appointed delegate from the Entomological Society of Ontario, to submit a brief report on its operations during the past year. It is very satisfactory to state that, after a highly useful existence of thirty years, the Society flourishes with unimpaired vigor, and that its members continue with unabated zeal, the investigation of the insect fauna of our vast territories to the gain both of science and of the agricultural industries of the country.

The *Canadian Entomologist*, the official organ of the Society, completed, during 1892, its twenty-fourth volume, and the demand for admittance to its pages was so great that they were increased from the standard number of 240 to no less than 323. There were fifty-two contributors to the volume; among them many of the most prominent entomologists of Canada and the United States.

In the systematic papers were published descriptions of five new genera, and ninety-six new species of insects; chiefly Diptera, Lepidoptera and Hymenoptera. Of more than ordinary interest were some of the articles on collecting, breeding, geographical distribution, classification, etc.

The following were some of the more important papers published during the year:

Can Insects Survive Freezing? Mr. H. H. Lyman.

Entomology for Beginners—Three papers, Mr. J. Fletcher, Mr. H. F. Wickham.

Descriptive papers on N. A. Diptera, Mr. C. Tyler Townsend.

Notes on Coleoptera, Dr. John Hamilton.

Orthoptera of Indiana, Mr. W. S. Blatchley.

Miscellaneous Notes on Butterflies, Larvæ, etc., Mr. W. H. Edwards.

Getting Butterfly Eggs, Mr. W. G. Wright.

Classification of North American Spiders, Mr. Nathan Banks.

New North American Homoptera, Mr. E. P. Van Duzee.

New North American Microlepidoptera, Prof. Fernald.

Canadian Galls and their Occupants, Mr. Wm. Brodie.

Four Insect Monstrosities, Mr. H. F. Wickham.

Insects attracted by Fragrance or Brilliancy of Flowers for purpose of Cross-Fertilization, Dr. R. E. Kunze.

The Inhabitants of a Fungus, and Life History of Xenos, Mr. H. G. Hubbard.

A full report was also published of the meeting of the Entomological Club of the A.A.A.S., including the very valuable address of the President, Mr. E. A. Schwarz, which dealt very thoroughly with the work hitherto accomplished in North American coleopterology. When to the foregoing contents are added the book notices of current publications on economic and systematic entomology, correspondence and records of varieties and rare species, obituary notices, etc., the result is a volume of much value and interest to all who are interested in the study of insect life.

The society also furnished to the Ontario Department of Agriculture the usual annual report (No. 23) which consisted of 88 pages, with numerous illustrations. In addition to a full report of the proceedings at the annual meeting of the society, it contained some valuable special papers, of which may be mentioned the following:

A Visit to the Canadian Haunts of the late Philip Gosse, Rev. T. W. Fyles.

A Trip to Mount Washington, Mr. H. H. Lyman.

Notes on the Rarer Butterflies of the Province of Quebec, Rev. T. W. Fyles.

On the Power of Insects to Resist the Action of Frost, Mr. J. A. Moffat.

Some Injurious Microlepidoptera, Mr. J. A. Moffat.

The Hornfly, Mr. James Fletcher.

Clothes Moths, Mr. James Fletcher.

The Songs of Our Grasshoppers and Crickets, Prof. S. H. Scudder.

The thirteenth annual meeting of the Society was held in its rooms in London, on Wednesday, August 21st, and Thursday, September 1st. The President, the Rev. Dr. Bethune, F.R.S.C., delivered a very valuable address, in the course of which he discussed those insects which had been reported as most numerous and destructive during the year. Interesting papers were also read by several members, and reports were received from the Geological, Botanical, Ornithological and Microscopical Sections, and also from the Montreal Branch, which for many years has regularly brought together for mutual instruction the students of entomology in that city and vicinity.

The Society was honored during the year in the election of Rev. Dr. Bethune to the distinguished position of President of the Entomological Club of A. A. A. S., and Vice-President of the Association of Economic Entomologists.

TWENTIETH ANNUAL REPORT OF THE MONTREAL BRANCH OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO.

The council beg to submit the following report of the work of the Branch during the session of 1892-93.

Eight monthly meetings have been held and the following papers have been read:

Notes on Zaraea Americana, Rev. T. W. Fyles.

A Trip to Mt. Washington, H. H. Lyman.

Notes on the Lepidoptera of Cap a L'aigle P. Q., A. F. Winn.

Preparatory Stages of Anisota Pellucida, H. H. Lyman.

Life History of Nemeophila Scudderii, H. H. Lyman.

Notes on Taxonus Dubitans and T. Nigrosoma, J. G. Jack.

Notes on Collecting Sesiidæ in the London (England) District, L. Gibb.

List of Lepidoptera collected by Dr. Bell in the Country North of Lake Huron, H. H. Lyman.

We have, since our last annual meeting, lost another of our members who was an enthusiastic worker in the study of insects, by the death of Mr. J. W. Cushing.

Your council regret that the attendance at the meetings during the past season has not been as good as in former years, and would urge on the members the necessity of doing all in their power to increase the interest of the meetings and to endeavor to add to our roll as many new names as possible.

The report of the Treasurer shows a balance at our credit of $19.24.

Submitted on behalf of the council.

(Signed) H. H. Lyman,
President.

The following officers were elected for the ensuing year:

President, H H. Lyman; Vice-President, L. Gibb; Sec.-Tres., A. F. Winn; Council: J. F. Hausen, H. B. Cushing.

Regret was expressed that no member had been able to represent the Society at the annual meeting of the Association of Economic Entomologists held at Madison, Wisconsin, in August. (Through the kindness of Mr. Howard, a full account of the proceedings has been received and will be found in subsequent pages of this report.). At the meeting of the Entomological Club of the American Association for the Advancement of Science, held at the same place, Mr. Lyman, of Montreal, one of our members, was present, and read a paper on *Hepialus Thule*.

A paper entitled "Notes and Queries," by the Rev. Dr. Holland, of Pittsburg, was read by Dr. Bethune; the writer referred especially to the occurence of *Erebus odora*, *Papilio cresphontes* and *Philenor* and other insects. In the discussion that followed, it was stated by Messrs. Moffat and Saunders that they found *P. cresphontes* in abundance about London, and also its larvæ. Dr. Bethune reported having taken it at Roach's Point, Lake Simcoe, on the 28th of August last. He mentioned also the capture at Port Hope, on the 15th of October, of a male specimen of *Colias Eurytheme*, the first that he had seen in that neighborhood. *Papilio philenor* had formerly been taken near Toronto and Hamilton, but not of late years; its larvæ had been found at Ridgeway feeding upon Wild Ginger, *Asarum Canadense*.

Mr. Fletcher exhibited an illustration of a gall on *Negundo aceroides* made by a moth, and described its peculiarities; also specimens of *Silpha bituberosa* from Saskatoon. Some larvæ were recently sent him from there, which were feeding upon *Monolepis chenopodioides*, an abundant plant in the prairie region; from these he bred the beetle, *S bituberosa*.

Mr. Elliott exhibited some galls found on Hackberry, *Celtis occidentalis*, which are probably the work of a Psylla. This elicited a discussion on the very remarkable distribution of the tree in Canada, which occurs in small numbers in isolated localities, as for instance at Como, P.Q., Ottawa, Bowmanville and the neighborhood of London.

Mr. H. Stevenson showed an interesting prickly gall from the wild blackberry, *Rubus villosus*, which was probably produced by a *Rhodites*.

The Rev. T. W. Fyles read a paper on "Notes of the year 1893." In the discussion that followed, Mr. Fletcher stated that he had found *Telea polyphemus* on Cornus; he had also found *Catastega aceriella* very abundant on maple trees at Ottawa. *Nisoniades Horatius* was this year quite common on Columbine (*Aquilegia*); of *Argynnius triclaris* he had taken seven specimens near Ottawa, a butterfly that hitherto has only been known to occur in the barren lands of the Peace River.

Mr. McGill exhibited his patent Composition Tree-protector, which is very simple in construction, easy to apply and an excellent defence against canker-worms, and also useful as an attractive hiding-place for codling worms and other larvæ.

The meeting adjourned at 5.30 p.m.

EVENING SESSION.

In the evening the Society held a public meeting in its room in Victoria Hall at 8 o'clock, which was largely attended by members and other friends from London and the vicinity. In addition to those already mentioned as present in the afternoon, the following were noticed: Rev. Dr. Andras, Mr. J. Foote, Dr. Woolverton, Dr. Wilson and others. The chair was taken by Mr. Denton, the Vice-President, who apologized for the unavoidable absence of Mr. Harrington, the President of the Society.

REPORT OF THE COUNCIL.

The following report was then read by the Secretary and adopted:

The Council of the Entomological Society of Ontario beg to present the following report of the proceedings of the Society during the past year. The membership of the Society shews a considerable increase over that of last year, especially in the addition of a large number from the Province of Ontario. Much interest has continued to be taken in the various departments of the Society and much satisfactory work has been accomplished.

The Twenty-third Annual Report on practical and general Entomology was presented to the Minister of Agriculture in November last, and was printed and distributed early in January. It consisted of eighty-eight pages and was illustrated with forty five wood cuts. The report contained, among other interesting matter, a remarkable paper by Mr. S. H. Scudder on "The Songs of our Grasshopers and Crickets"; a long and interesting account by Rev. T. W. Fyles of "A visit to the Canadian Haunts of the late P. H. Gosse," which was especially noticed by the Toronto *Globe* of April 6th, and other newspapers; also a timely article by Mr. Fletcher on the Horn fly.

The *Canadian Entomologist* has been regularly issued at the beginning of each month and completed its twenty-fourth volume in December last. It consisted of 323 pages, being the largest number yet issued. Ten numbers of the twenty fifth volume have been published, each averaging twenty six pages. The Council take this opportunity of thanking their numerous contributors, among whom are included all the leading Entomologists of North America, for their valued assistance, which has enabled them to maintain the position held for so many years of being one of the leading Entomological journals of the world, as well as the best in America. The library has been increased by the addition of seventy valuable works, making the whole number of volumes in the rooms of the Society nearly thirteen hundred.

A considerable number of rare specimens have been added to the collections, and the Council have pleasure in again acknowledging the careful and painstaking services of the Curator, Mr. J. Alston Moffat, who has at all times shown his readiness to assist the members, and particularly beginners, in the identification of specimens and the prosecution of their studies.

Interest in the various sections engaged in the study of the allied sciences of Botany, Microscopy, Geology and Ornithology, has not flagged, a number of new members having been added to the Society through this channel, and good work accomplished in each branch. Reports from the sections are submitted herewith and will be found to give an outline of the work undertaken.

The annual report of the Treasurer shows a present balance of $457.54, which amount will be scarcely sufficient to meet the expenses of the Society during the winter session, but by careful economy it is hoped that the expenditure will not exceed the balance in hand to any great extent.

The Society was represented at the meeting of the Royal Society of Canada, which was held at Ottawa in May last, by your President, Mr. Harrington, whose report is presented herewith.

All of which is respectfully submitted,

(Signed) W. E. Saunders, Secretary.

In the absence of the President, Mr. James Fletcher, Dominion Entomologist, gave a highly interesting address upon the chief insect attacks of the year, which was listened to with great attention.

INJURIOUS INSECTS OF THE YEAR.

By James Fletcher, Ottawa.

I regret that the President has been prevented from being here to day to deliver his annual address. I am sure that some very important business in connection with his office has caused his absence, as I know that he fully intended to be present. I am glad to be able to report that no serious new pests of the farm have made their appearance during the past season, and with the exception of the Horn-fly and three species of Locusts, generally known under the collective name of "Grasshoppers," none of the old enemies have shown themselves in unusual numbers. Of household pests the common Clothes Moth (*Tinea la biselliella*, Hum.) was for some reason extremely abundant and injurious in many parts of the Province. Two of the most interesting attacks which have been brought under my notice are: (1.) The gall-making larva of a small moth which passes its larval life in the young twigs of the ash leaved maple, *Negundo aceroides*. Several specimens of the swollen twigs containing caterpillars were sent to me from Mr. W. G. Fonseca, of Winnipeg, who has observed the insect for some years. I was able to breed the moths this year as well as two distinct parasites. None of these have yet been named. About half the larvæ were found to be parasitised. (2.) The other attack alluded to is of the larvæ of one of the Carrion beetles, *Silpha bituberosa*, Lec., upon squashes and chenopodiaceous plants at Saskatoon in the North-West Territories. In England a closely allied species, *S. opaca*, is sometimes a serious enemy of the beet-root. It is this fact which gives the present record importance, from the possibility of *S. bituberosa* developing a taste for cultivated plants as the country becomes more settled. The larvæ are nocturnal in their habits, black, half an inch in length, shaped like wood-lice and are very active. I received the larvæ when nearly full-grown and soon afterwards they buried themselves in the earth. About two weeks later the beetles

emerged. At first I took them for the European species, which, however, it is said, also occurs in this country, but Dr. George H. Horn has kindly identified them for me as *S. bituberosa*, a native species of the North-West Territories. It is probable that the usual habit of this insect as well as of *S. opaca* is to feed upon carrion; but the fact that they occasionally develop a taste for vegetation makes it necessary to be on guard against them.

Cut-worms were as usual complained of in various districts, the species most commonly sent in being *Carneades messoria*, Harr. (Fig. 1) in onion-beds, *C. ochrogaster*, Gn., omnivorous and *Noctua fennica*, Tausch, chiefly in clover and pea fields. The easy remedy of wrapping a piece of paper around the stems of freshly planted tomatoes and cabbages is becoming very popular amongst those who have tried it. In my own experience I have found it one of the most satisfactory remedies. It is done at the time of planting, is very easy and takes hardly any time. The easiest way is to have a bundle of paper all cut to the right size, about three inches square. Thread these close to one corner on a loop of string and tie this to the basket or box in which the young plants are carried to the field. Before planting a cabbage, pull off one sheet of the paper and lay it on the palm of the left hand, then taking the young plant in the right hand place the stem across the paper and close the left hand, this will leave a loose collar of paper around the stem between the top and the root. When planting leave about two inches of the paper above the ground.

Fig. 1.

The *Turnip Flea*.—On the whole, there have been fewer complaints of the flea beetle (Fig. 2) this season than for many years. The best remedy is to dust the young plants as soon as they appear above the ground with a mixture of land plaster and Paris Green in the proportion of 25 to one. The land plaster acts as a stimulant to the young plants and soon pushes them past the stage when they are liable to injury from the beetles. The mixture must be perfectly dry. Leaf hoppers of various kinds have been abundant in some localities and upon various crops. *Erythroneura vitis*, Harr., the Leaf-hopper of the Vine sometimes called "The Thrip," has been successfully treated upon the Virginia creeper and grape by spraying with Kerosene Emulsion. Another species, *Empoa fabæ*, Harr., has been abundant and injurious upon the English Horse-beans, which are now being extensively grown by farmers for mixing with Indian corn and the seeds of sunflowers in the preparation of ensilage, according to the new Robertson combination. The horse-bean seems to be very susceptible to injury from insects. The *Empoa* above named causes the leaves to turn black and dry up. A large flea-beetle (*Systena frontalis*, Fab.) also injured this plant, among several others, by eating the soft tissues of the upper surface of the leaves. The common Red-legged Locust was even more injurious in the same way, and in the North West Territories, the large and beautiful Western Blister beetle (*Cantharis Nuttalli*, Say) entirely defoliated patches of these beans. The sunflower, grown for the seeds, was not without its enemies either—early in the season Cut worms attacked the young seedlings and later the stems of many plants were much weakened by the pith being entirely consumed by the larva of the beautiful Trypetid fly (*Straussia longipennis*, Wied). The female is furnished with a hard ovipositor by means of which she inserts her eggs into the stems while soft and the young larvæ live in the pith. They pass the winter as pupæ in the ground and the perfect flies appear in June, when they may be found on Sunflowers and the Jerusalem Artichoke. The fly is deep honey yellow with bright green eyes and has the wings prettily mottled with brown. The season in the Ottawa district has been a particularly wet one and as a consequence some of the usually abundant injurious insects have been conspicuous by their absence. Of

Fig. 2.

these mention may be made of the Colorado Potato beetle which has been kept in check with less trouble than usual. Of course the only practical remedy is Paris Green, which meets all requirements cheaply and effectively. Several instances have been brought under my notice of the ravages of the Gray Blister-beetle (*Macrobasis unicolor*, Kirby) upon Potatoes and Horse-beans. This beetle is most frequently found in the perfect state upon the Fall Meadow Rue (*Thalictrum Cornuti*) but also occurs on other plants. In the larval condition it lives as a parasite upon the eggs of Locusts. A closely allied species with similar habits was sent in from two or three localities as a pest upon mange's, vegetables and garden Asters, of which last it destroyed the flowers.

Red Spiders have been abundant and injurious to many plants in those parts of Ontario where dry weather has prevailed, currant bushes and beans were particularly attacked. Spraying with a weak Kerosene Emulsion has been found to be one of the best remedies. On the Experimental Farm a small species of *Scymnus*, one of the Lady-bird beetles, was found to be very useful in thinning their numbers.

A stalk borer (*Hydræcia cataphracta*, Grt.) was locally troublesome in tomato fields and also occurred in several herbaceous plants, as holyhocks, sunflowers and lilies.

The root maggots of the cabbage and onion still remain troublesome pests of the market gardener. When attacking cabbages, the best results have been obtained by pouring hellebore-tea around the roots, and with onions and radishes some experiments with common salt were apparently attended with the greatest measure of success this season. These experiments will be repeated again next year.

Two of the true bugs *Lygus pratensis*, L., the Tarnished Plant-bug, (Fig. 3) and *Pœcilocapsus lineatus*, Fab. both common species, have been very abundant and injurious in some localities this year. Perhaps the most practical remedy for these is beating the infested plants over a beating net or pan containing some water, with a little coal oil on the surface. This is best done early in the morning when the insects are not so active as later in the day.

Several kinds of plant lice have been abundant in gardens. Species upon turnips, carrots, cabbages and celery having been sent in. The best remedy for these insects, where it is practicable, is to spray the plants with a kerosene emulsion, as early as possible in the season, before they have multiplied.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

Of insects injurious to forest trees mention may be made of two small caterpillars which have been attacking the maples in some parts of Ontario and Quebec. The first of these *Incurvaria acerifoliella*, Hew. is a case-maker, which cuts out round disks of the maple leaf and forms a flat case, inside which it lives. In the autumn it falls to the ground and passes the winter inside its case as a pupa. The tiny steel-blue moths, with orange collars, emerge the following spring. The other is the species which has been mentioned by Mr. Fyles, possibly *Catastega aceriella*, Clem. The larva forms a tent between the two surfaces of the leaf and lives inside a tube made out of its own frass. This tube starts close to the petiole and gradually enlarges as the larva grows, until it

reaches about two inches in length. The tents were so abundant this autumn in some places that the maple trees about Knowlton and other places round Brome Lake in the Eastern Townships were much distigured. It is also very abundant at Ottawa. I have never seen the moth yet, but have several of the larvæ and pupæ in my breeding cages, from which I hope to get the moths next spring.

Of fruit insects, some of the well known pests have called for attention, as the Eye-spotted Bud moth (*Tmetocera ocellana*, Schif.), on the apple and plum, the Oyster-shell Bark-louse (*Mytilaspis pomorum*, Bouché), the Beautiful Wood Nymph (*Eudryas grata*, Fab.). Fig. 4 represents the moth and Fig. 5 the caterpillar. The Codling Moth (*Carpocapsa pomonella*, L.) and the Plum Curculio (*Conotrachelus nenuphar*, Hbst.). For these the well-known remedies have been recommended.

Injuries of less frequent occurrence have been reported by the following: Click beetles, which have injured the flowers of apples at Ottawa and of pears in Nova Scotia. The Shot-borer or Pin-borer (Fig. 6) (*Xyleborus dispar*, Fab.) has increased and is doing much injury to the apple-growing districts of Nova Scotia. Washing the trees in June with a soap or lime wash, to which a little Paris green has been added, will probably be found to be the best remedy. In the Niagara district I found last spring that the peach trees were much infested by the Peach-bark beetle (*Phlœotribus liminaris*, Harr.). This is a very small Scolytid and can be easily recognized by its laminate antennæ.

A new pest of the apple in Canada has been sent to me by Mr. R. Z. Rogers, of Grafton, Ont., and Mr. F. J. Watson, of Okanagan Mission, B.C., namely, the Otiorhynchid beetle *Anametis grisea*, Horn. The beetle gnaws the bark from the twigs and also eats out the buds. I have not yet worked out its life-history.

As mentioned above, the insects which have attracted most attention during the season of 1893 by their injuries are the Horn fly (*Hæmatobia serrata*, Rob.-Desv.) shown much enlarged at Fig. 7, and the three common locusts, which occur all through

Fig. 7.

Ontario. As was anticipated, the Horn fly, since first noticed last year, has spread far and wide over the Province, and although there has been a great hue and cry amongst farmers, very few of them have systematically treated their cattle to protect them from the attacks of their tormentors. The loss consequently has been very great, owing to the falling off in the quantity of milk produced at the season of the year when it should have been most plentiful. It is not probable that the Horn fly will continue to be as serious a pest after a year or two as it is at present in Ontario, nevertheless it is an important matter that dairymen and farmers should adopt some one of the simple and effective remedies which have been discovered and practise them regularly if they wish to keep their stock in a state of comfort and prevent an unnecessary shortage in their bank accounts. In the first place

it is necessary to remember that the Horn-fly does not in any case breed (that is, pass its preliminary stages) on or in the cattle; but the eggs are laid on freshly dropped cow dung; the young maggots hatch within 24 hours and live until full grown in the moist excrement; this takes about a week; they then burrow down a short distance into the ground and assume the pupal form, from which, in about another week, in summer, the perfect flies issue. The last brood of autumn passes the winter beneath the ground within the puparia. The flies are extremely active and swarm on cattle, biting them and giving them much annoyance from the irritation of their bites. The name Horn fly is applied to this insect from its habit of clustering upon the horns of cattle. Here they are out of the reach of the animal's tail and are not easily dislodged. They do no injury whatever to the horns.

Remedies. The remedies are simple, but require constant attention to be effective. Almost any greasy substance rubbed over the parts of the animal usually attacked will prevent the flies from biting for two or three days. For this purpose "tanners' oil" or any other cheap fish oil is satisfactory, and if a small quantity of carbolised oil, which can be prepared in a short time by any druggist, be added, the effect will be more lasting and the application will have a healing effect upon any sore which may have been made by the animal rubbing or licking itself. An easily applied remedy, which has been found effective by most who have tried it, is the kerosene emulsion, which is practically a mixture of soapsuds and coal oil in the proportion of two of coal oil to one of soapsuds. To make the emulsion, boil half a pound of any common hard soap in one gallon of water; when all is dissolved, and while boiling hot, pour it into a large tub containing two gallons of coal oil, then churn this well with a syringe or force-pump for five minutes, when the mixture will be smooth like cream. This emulsion cools into a jelly-like mass, and may be kept for any length of time if placed in a cool cellar. When required for use, it may be diluted with cold water to the strength required. One part of the emulsion to nine of water works well. It is easily applied to the animals by means of a force pump and spray nozzle. While the flies are bad, it should be applied every other day for a fortnight; after that the odour of the accumulated coal oil will keep them off for a longer time. There certainly is a good deal of work about this application which farmers may object to, but so long as the flies are as numerous as at present, it will be necessary to take these extra precautions if they wish to protect their cattle and their own interests. It is well to mention, however, that in all the districts in the United States where three or four years ago this insect was extremely abundant, it has decreased greatly in numbers, and there is every reason to anticipate that this will be the case here too.

Throughout all the western portions of the Province a large amount of loss has been caused by locusts. All the specimens sent to me have belonged to three different species, which are always common, viz., the Red-legged Locust (*Melanoplus femur-rubrum*, DeG.) Fig. 8. The Lesser Migratory Locust (*Melanoplus atlanis*, Riley) and the Two-striped Locust (*Melanoplus bivittatus*, Say.). The Red-legged Locust has a very wide range and is common in all parts of the country. It attacks all kinds of vegetation, and has a particularly bad habit, which has been much noticed this year, of biting off the heads of oats just before they ripen. The Lesser Migratory Locust resembles the last named very much. It is, as a rule, rather larger and brighter in colour. It has longer wings and can always be separated from it by the sharply-pointed sternum or breast-bone, that of *femur-rubrum* being spatulate or enlarged at the apex. This species is migratory in its habits, like the Rocky Mountain Locust, and frequently is the cause of great injuries to crops, not only in the North-west, but in Ontario and New England; in fact, Prof. Bruner credits it with being the species which most frequently does the locust injury in the New England States.

Fig. 8.

The Two-striped Locust is a large, heavy-bodied and voracious species, which destroys a great amount of vegetation. It generally frequents rank growing plants in low ground, but as often occurs in gardens, where it is very troublesome.

Locusts are, as a rule, kept within due limits by their many enemies, but occasionally they appear in large numbers and increase so much as to cause locust plagues or "grasshopper years." This is generally in dry summers, when they get the conditions which are most advantageous for their development, but which are adverse to the free growth of vegetation. In such years it is necessary to have recourse to artificial means to protect crops. The most successful of these have been the plowing under deeply of the eggs, which have been known to have been deposited in certain localities, before they have time to hatch, and the use of the tar-pan or "hopper-dozer," by means of which the insects are caught in large numbers and destroyed before they have developed their wings. These tar-pans are large, shallow pans, made of sheet iron after various patterns, but, as a rule, about twelve feet long by three wide, with the edge turned up slightly in front and the back about eighteen inches high. In the bottom of these pans a small quantity of tar or coal oil is placed and they are then drawn over the fields by horses. The grasshoppers spring in the air when the pan is drawn towards them and fall inside the pan, where they come in contact with the tar or oil, and even if they hop out again they are sure to die. In this way enormous quantities are destroyed every year in the Western States.

A vote of thanks to Mr. Fletcher, for his valuable and highly interesting address, was moved by Rev. T. W. Fyles, who remarked, in doing so, upon the occurrence at Quebec of both the species, *Orygia leucostigma* and *antiqua*. Dr. Bethune cordially seconded the motion and expressed the great pleasure that all present had experienced in listening to the address. In the course of his remarks he referred to the unusual abundance this year of the Tomato-worm, the larvæ of *Sphinx quinquemaculata*, and of several species of grasshoppers and to the entire absence in his garden of the Pear-tree slug, which had been very abundant and injurious for several years previously. He stated that a friend, resident in Toronto, was of opinion that the number of house flies had been very greatly diminished by the English sparrow, which devoured the larvæ, and enquired whether this observation was correct. He spoke also of the publication of a bibliographical catalogue of the Noctuidæ of North America, by Prof. J. B. Smith, as one of the notable events of the year.

Mr. Denton, in putting the motion to the meeting, spoke of the value of the remedies for the Horn fly, and gave instances of herds of cattle being kept in splendid condition by being protected from the attack of this annoying insect.

The reports of the different sections for the past year were next read by their respective secretaries.

ANNUAL REPORT OF THE ORNITHOLOGICAL SECTION OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO FOR 1893-3.

This section has held about half a dozen meetings during the year, most of which have been attended by almost every member. The approach of the collecting season, however, led to such a scant attendance that the meetings were dropped.

A ledger was opened to record the distribution, abundance, nesting habits, etc., of the birds of Middlesex and surrounding counties, on which several evenings' work was done before the cessation of meetings, and it is the intention of members to push it to completion, if possible, during the coming season.

Each member of the section has been devoting himself to the special study of one bird, and the hawk family has thus been divided between the members for report this present fall. Good results are looked for from this concentration of work.

No very rare birds were observed during the season, but the Olive-sided Flycatcher and the Fox colored Sparrow were observed to justify the opinion of their increased local abundance, while the Tennessee warbler was unusually common for a few days in spring, and was singing freely, a habit which was not previously noted in our locality. All of which is respectfully submitted.

W. E. Saunders, Chairman.
W. J. Stevenson, Secretary.

REPORT OF BOTANICAL SECTION OF ENTOMOLOGICAL SOCIETY.

The Botanical Section held their first meeting for 1893 on April 29th, and from then till July 1st, weekly meetings were regularly held. The attendance at the meetings and the interest shown have been greater than in previous years. A careful list of the plants observed by members, their localities and dates of blossoming, has been made out. Outings to Port Stanley and to Komoka were very interesting and fruitful.

A large portion of the collection presented to the Section by Wm. Scott, B.A., of Ottawa, has been mounted by Mr. Balkwill, and the work will probably be completed during the ensuing winter. Our herbarium is increasing and we hope to make it thoroughly representative of the district.

Observations worthy, perhaps, of mention are the finding of *Moneses uniflora* and *Hypoxys erecta*, growing plentifully at Komoka, these being the first records for that district for some years at least. *Hedeoma Drummondi*, not mentioned by Macoun, and in late editions of Gray said to extend from Ohio southward to Texas, was also found near Komoka. A remarkable case of fecundity of the Beech is reported by Mr. Balkwill, who finds the cupules containing as many as six nuts each. Mr. Moffat found several specimens of *Aphyllon uniflorum* growing near the city, not before reported nearer than Port Stanley.

W. T. McClement, Secretary.

REPORT OF THE MICROSCOPICAL SECTION OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO.

I have much pleasure in placing before you the annual report of our Section. It is now three years since this section was organized, and we can look back with pleasure on the work of the past few years.

Thirteen meetings were held during the season which has just closed, from October 22, 1892, to May 19, 1893, when our section adjourned during the summer months. Our total membership numbers fourteen, an increase of fourteen per cent. since last year, with an average attendance of (13) thirteen, an increase of 45 per cent. over last year, which shows the interest the members are taking in this part of the work.

The work undertaken by the Section has been of a very practical and useful character. Members have been thoroughly drilled in the cutting of sections, staining and mounting them. During the past year we have had several outings, when the manner of collecting material has been practically demonstrated, and we feel confident that this method of work adopted by our Society will make our members skillful in microscopical manipulation and will also acquaint them with all the uses a microscope can be put to.

Several new microscopical (fungi) plants have been added to the list and their life history worked out.

We are deeply grateful to the parent Society for the very liberal manner in which they have supplied us with periodicals and the great encouragement they have given our Section. We are sure that in return the Section will become a valuable adjunct to the Society.

The subjects for the various meetings during the season were as follows :

Oct. 22nd, 1892 : Open meeting. Examination of pond water. Discussion as to arrangement of meetings for the term. Each member is assigned a subject which he is expected to work up as far as possible and then report on it.—J. M. Denton, Chairman.

Nov. 6th : Study of Desmids, by J. H. Bowman. Closterium and many others exhibited and described.

Nov. 20th : Open meeting.

Jan. 6th, 1893 : Reports of outings during Christmas holidays. Business meeting.—J. M. Denton, Chairman.

Jan. 20th: (1) Clothes moths, by J. Dearness. An article by James Fletcher was quoted upon clothes moths, Tinea or Bisselliella, from 23rd Annual Report, page 53. Samples of fabric damaged by this insect were examined.

(2) Desmids. 1st, how to collect; 2nd, where to collect; 3rd, what to collect, either as useful, beautiful or scientific objects, by J. H. Bowman.

Feb. 3rd: Study of urinary deposits and what they signify, by Dr. J. P. Burkholder.

Feb. 20th: Two lectures were delivered by Dr. J. P. Burkholder on the Mounting of Animal Tissue and Preparation and Staining.

March 3rd: Mounting of Animal Tissue continued. The use of the microtome, by Dr. J. P. Burkholder.

Several very interesting sections were prepared and mounted under the lecturer's instructions.

April 7th: Three lectures were delivered on Vegetable Tissue, by J. Dearness. Preparation of Vegetable Tissue.

April 21st: Staining of Vegetable Tissue, by J. Dearness.

When is double staining necessary? Alum cochineal as a stain. Picro lithium carmine as a stain. Several specimens of ferns were stained.

May 5th: The mounting of Vegetable Tissue, by J. Dearness.

The several specimens of ferns which were stained last evening were mounted.

May 19th: Report on the Examination of Dawson's Pond, by J. H. Bowman.

A microscopical exchange was arranged with A. Allen, of London, Eng.

All information as to the Society's microscopes, books and mounts, the number of members owning microscopes, will be found in "The Microscope," page 38, vol. 1, No. 3. (Washington, March, 1893.)

All which is respectfully submitted.

H. A. Stevenson, Secretary.

REPORT OF THE GEOLOGICAL SECTION.

With regard to the work accomplished by this section of the Society: The surrounding district of London has been searched wherever an outcrop of the base rock could be found exposed from the overlying lacustrine and boulder drift. The bed of both forks of the river Thames as far as Dorchester and St. Marys in one direction, and Kilworth and Komoka in the other, including a very good exposure of the quarries at Springbank, as also some miles of the river midway, were searched and found to yield many good specimens of Phalops, Bato, Strophomena, Spirifera, Strinklandia, Orthis, Spirigera and a very peculiar specimen of the squid tribe, possibly an Onioceras. Some of the members have extended their researches further afield, and in the gorge of the Grand River at Elora and Galt have unearthed Phragmoceras, Onoceras, Megalomus Canadensis, Littuites, Bellerophon—a fine specimen of the last was obtained from the cliff above Wiarton. The Rev. C. H. Andrus, who has lately joined the society and has proved a very active member, has added very much to the knowledge of the fossils and minerals of this portion of Ontario and has visited also the mineral regions north of Lake Huron, discovering traces of gold in a blue quartz matrix in various districts along a line of 200 miles following the route of the C. P. R., specimens of which, as well as those of the copper, nickel and silver of these districts of mineral wealth have been exhibited to the society and now form a portion of the private collection of the professor at Huron College.

During the year a report appeared in the local press that coal had been discovered in the Lambton formation at Kettle Point. To verify this the chairman (Dr. Wadsworth) accompanied by Profs. Andrus and Sherwood, visited the district in question and found thin bands of bituminous coal in the Devonian shale which crop out at this point. It is questionable, however, whether workable coal could be obtained here, for a few miles

south of this—at Ilderton—a boring was made through this shale formation which proved only natural gas in a small quantity and upon being continued deeper, a bed of salt was reached which is now being worked—the salt works being lit by the gas thus obtained. Perhaps the most remarkable objects in the vicinity of Kettle Point are the globular concretions of semi-crystalline limestone, ranging in diameter from two to six feet and of an internal radical structure and bituminous in nature. Several specimens were obtained and brought home by the party. In all these expeditions the local collections have been visited and their cabinets overhauled and exchanges made of duplicates. An interesting point to Geologists is Thedford and its vicinity—the railway cutting close by abounds in specimens of spirifers, orthoceras and fossil corals in great abundance, Favosites Cyathophyllum and Helliolites Halli. A fine collection of the local fossils has been made by the Rev. Mr. Currie, the Presbyterian pastor. A great need of geological maps of the peninsula has been felt to enable this society to carry on its work more thoroughly and profitably. The library on the other hand is well supplied with Geological literature which this section highly appreciates, but would gladly welcome any additions of more recent publications as they appear. The want of room greatly contracts the possibilities of the society. It has now been felt, and the feeling is widely expressed, that the time has arrived for the society as a whole to obtain more commodious premises, in order that not only the parent Society should have more room for the display of its own fine collections of insects (at present by no means shown to advantage owing to the difficulty of access by three flights of stairs and the crowded condition in which they are arranged), but also that the sub-sections might each have the opportunity of making a display of its collections. This branch at least feels that from its progress and increase of numbers this is worthy of the consideration of the parent Society. We have the honor to submit to this Society the foregoing as our report for the year past.

S. Woolverton, Chairman.

ELECTION OF OFFICERS.

The following gentlemen were elected officers for the ensuing year :

President—W. Hague Harrington, Ottawa.
Vice-President—J. Dearness, London.
Secretary—W. E. Saunders, London.
Treasurer—J. A. Balkwill, London.
Directors—Division 1—James Fletcher, F.L.S., F.R.S.C., Ottawa.
" 2—Rev. C. J. S Bethune, F.R.S.C., Port Hope.
" 3—Gamble Geddes, Toronto.
" 4—A. H. Kilman, Ridgeway.
" 5—R W. Rennie, London.
Librarian and Curator—J. Alston Moffat, London.
Editor of the "Canadian Entomologist"—Rev. C. J. S. Bethune, M.A., D.C.L., Port Hope.
Editing Committee—J. Fletcher, Ottawa ; H. H. Lyman, Montreal ; Rev. T. W. Fyles, South Quebec ; J. M. Denton and J. H. Bowman, London.
Delegate to the Royal Society—Rev. T. W. Fyles, South Quebec.
Committee on Field Days—Dr Woolverton, Messrs. McClement, Elliott and Stevenson, London, and one representative from each section.
Auditors—J. H. Bowman and J. M. Denton, London.

A paper was then read by the Rev. T. W. Fyles on "Entomological Mistakes of Authors," which was highly enjoyed and appreciated by all present.

Mr. Fletcher drew attention to one point in the report of the Omithological section viz., the success achieved by devoting observations to one bird alone, and urged that this principle should be adopted by Entomologists, so that each one might work out the life-history of some particular insect.

The meeting adjourned at 10.30 p.m.

THURSDAY—MORNING SESSION.

The meeting was called to order by the Vice-President at 10 o'clock a.m.

A paper by Mr. A. H. Kelman, of Ridgeway, was read on a supplementary list of Coleoptera not previously recorded as taken in Canada. This paper, being of a technical character, will be published in the *Canadian Entomologist*.

Dr. Bethune read an extract from a newspaper, which stated that farmers in England were much alarmed because dead insects, especially grasshoppers, had been found in numbers in the recent large importations of hay from Canada. The purchasers feared that the animals fed upon the hay might receive injury from consuming the insects and the farmers were afraid that through the importation of the bodies of the insects the eggs of the locust might be introduced into England, and a locust plague be occasioned in the country. The despatch went on to state that "Miss Eleanor A. Ormerod, the great insect authority of England, the consulting entomologist of the Royal Agricultural Society of England, and special lecturer on economic entomology at the Royal Agricultural College of Cirencester, and who is also the English corresponding member of the Entomological Society of Ontario, has published very reassuring statements, which are calculated to allay all alarm. She says that it is unlikely that locusts will propagate in Great Britain, owing to the comparatively moist and cool climate. She also declares that there is no evidence whatever that locusts are at all prejudicial to the health of cattle that eat them." Dr. Bethune gave it as his opinion that the fears of the English farmers respecting the importation of our locusts were perfectly groundless, and there was no likelihood of eggs being hatched and colonies established from the dead insects carried over in bales of pressed hay.

The remainder of the morning was spent in the examination and determination of specimens, many rare and interesting forms having been brought to the meeting by Mr. Fyles, Dr. Bethune and some of the local members. After comparing notes on various matters of entomological interest, the meeting, which was greatly enjoyed by those who were present, was brought to a close. Much regret was expressed by all at the absence of the President, whose address will be found in the following pages. The members from a distance were much gratified at the kindness and hospitality rendered them and desire to record their hearty thanks to their kind entertainers.

ANNUAL ADDRESS OF THE PRESIDENT.

By W. Hague Harrington, Ottawa.

While the earlier incumbents of an office such as I have had this year the honor to hold, are fortunate in finding new lands through which to wander and from which to garner fresh crops, those who come in later years have, at least, well laid out fields to till and good plain paths to follow. As the President's address is published in the Annual Report which our Society prepares for the Ontario Department of Agriculture, and as the address is often his only contribution to the Report, it becomes almost imperative that it should be of as economic and practical a character as possible, and at the same time be worded, in such a clear and simple manner, that it may be readily understood, not only by the members of our own society, but by the larger audience reached by the Report. Instead, therefore, of endeavoring to treat technically, or elaborately, of any of the many special branches of Entomology, I shall keep in the well defined paths which my predecessors in office have laid out.

A city residence and official duties, which for several weeks in midsummer prevent any observations, combine to cause my work in Entomology to lack the continuity which is necessary for a thorough investigation into the life-histories of our insect foes and friends. The assistance of fellow-workers enables me, however, to say a few words about some of the more noticeable insects of the past season. Of these I shall first mention

several species of saw-flies, as I have endeavored to give somewhat special attention to the extensive and injurious section of phytophagous (plant-eating) Hymenoptera, to which these insects belong. I have not yet had time to catalogue all the species recorded from Canada, but I find that we have in the immediate neighborhood of Ottawa about one hundred and sixty species, of which several are decidedly obnoxious pests. Saw-flies are so named because the female has the ovipositor saw-like in form, and fitted to cut a slit in the leaf or twig in which she desires to deposit her egg. The worm hatched from this egg is not a footless maggot, such as that of the other sections of the Hymenoptera, but is provided with both thoracic and abdominal feet, is able to travel about in search of fresh food, and has much resemblance to the caterpillars of certain moths. The worms feed upon the tissues of the leaves, and, when numerous, soon strip the plants attacked. A good example of the ordinary saw-fly larva is the worm that is so troublesome on gooseberry and currant bushes, when they are not carefully sprinkled with hellebore.

The Larch Saw-fly (*Nematus Erichsonii*, Hartig.)

It would be almost impossible to calculate, and very difficult even to imagine, the enormous loss occasioned in the tamarack forests of Canada, during the past decade, by the inconspicuous insect which has become known to Entomologists as the Saw-fly of the Larch. The first mention of it in the Annual Reports of the Entomological Society of Ontario is found in that for the year 1883 (No XIV., page 17) where, in the account of the proceedings of the Annual Meeting, the Rev. Mr. Fyles, of Quebec, is reported as stating: "That much injury had been caused to the tamarack trees, *Larix Americana*, in Bury and the neighboring townships, by a species of saw-fly, the same, probably, as that which has caused so much injury in Maine and the other eastern States, *Nematus Erichsonii*."

The following year the same gentleman reported that: "The larch saw-fly had extended it ravages along the Beauce Valley to the neighborhood of Quebec, where it had stripped the tamaracks bare. A second growth of leaves had appeared, and this, probably, would save the trees."

Mr. Fletcher also spoke of the "enormous damage" done by this insect. He had first noticed it near Quebec, and had traced it down the Intercolonial Railway wherever any larch trees occurred, as far as Dalhousie (N.B.), where he found it abundant. He also exhibited a species of bug, *Podisus modestus*, which had been found destroying the larvæ at Brome, Que. (Ann. Rept. No. XV., p. 22.) The same Report (pages 72-77) contains a carefully prepared paper by Mr. Fletcher, on the habits and appearance of the insect.

In 1885 (Ann. Rept. No. XVI., page 12), Rev. Mr. Fyles reported: "That the insect had again been abundant at Quebec, and that tamaracks that had survived the attack of last year, now showed tokens of decay, some of the branches only putting forth a second crop of leaves, and that but a sparse one." He described the manner in which one of the fossorial wasps, *Odynerus capra*, had been observed to prey upon the larvæ. At the same meeting in "Some Notes on Tenthredinidæ, 1885," (Canadian Entomologist, Vol. XVIII., page 39), I mentioned the finding, at Ottawa on 24th June, of several colonies of the larvæ of this saw-fly upon trees near the line of the Canada Atlantic Railway.

Mr. John G. Jack, of Chateauguay, Que., in a paper read before the Montreal Branch on 9th Feb., 1886, records (Ann. Rept. XVII., page 16,) the occurrence of the destroying insects in his neighborhood as follows: "On July 5th I found some larch trees with the foliage very much destroyed by saw-fly larvæ, and on examining the trees in the woods and surrounding country, I found that they were all attacked. At this time most of the larvæ seemed to be a little more than half-grown, and they continued to feed until about July 15th, when some of them made cocoons. Many of the trees were now entirely defoliated, and the branches and twigs literally covered with the larvæ, many of which were dropping to the ground, and with the falling 'frass' made a sound like fast falling raindrops."

Prof. Saunders, at the Entomological Club of the A.A.A.S., in 1887, reported, "that in the Maritime Provinces, Nova Scotia and New Brunswick, he found the larch saw fly (*Nematus Erichsonii*), extremely abundant and destructive." (Ann. Rept. XVIII., page 31.)

Mr. Fletcher, in his address as President in 1889, made the following brief reference to the spread of this pest: "The larch saw-fly was very abundant in the neighborhood of Ottawa, and in fresh districts in the Maritime Provinces; the tamarack swamps being rendered almost leafless for hundreds of acres." (Ann. Rept. XX., page 3.)

The Rev. Dr. Bethune, in his address the following year, referred to the species briefly: "The larch saw-fly, to which reference has been made of late years, has not been nearly so abundant as usual in those parts of Ontario where it has hitherto prevailed. It is to be hoped that its natural enemies have multiplied to a sufficient extent to keep it in subjection and prevent its undue increase." (Ann. Rept. XXI., page 7.) In 1891 he again stated that it "continues to be very abundant and destructive. Unfortunately it is a kind of attack for which there seems no practicable remedy" (Ann. Rept. XXII., page 14.) At this meeting also the Rev. Mr. Fyles presented a valuable paper entitled, "*Nematus Erichsonii*; a Retrospect" (l. c. page 28,) to which reference will be made presently.

I have now traced the progress of this obnoxious insect, as recorded in the publications of our society, but a few remarks may be added on its later ravages, and the extent to which it may have permanently injured the tamarack areas of the Dominion. While we have seen that as early as 1883 it had spread through Quebec, it is probable that it had been in Canada at least a year or two previously, but had only then reached a locality where it came under the notice of an entomologist.

My own observations along the line of the Intercolonial Railway and the Maritime Provinces, during the period elapsed since the insect was first reported, fully confirm the extent of the injury wrought in the tamarack districts, and the extent to which the trees were killed. Up to 1890, however, the insect had not, as far as I could see, invaded the Island of Cape Breton, but in the autumn of that year I found, not many miles from old historic Louisburg, a single twig with the characteristic twist and the evidence of oviposition, showing that the enemy had crossed the island. I did not find other evidences of its presence, and all the surrounding trees looked most healthy and vigorous. The worms were in this year reported as very abundant in Prince Edward Island.

The next year I did not visit Cape Breton, but in the beginning of September, 1892, just after our annual meeting of that year, I was in Sydney, and, on driving out through the surrounding country, found that the beautiful green tamarack groves and forests, which (with spruce) are in this section of country quite extensive, had the fire-swept appearance caused by the ravages of the saw fly, and I was informed that in the previous summer they had been almost as much defoliated. The lower portions of many trees and small trees had, as elsewhere, partially escaped, but many of the larger trees seemed to be killed. This year the same dreary appearance was observed, and there is no doubt that very serious loss of older trees has been caused.

Whence came the obnoxious insect which has so devastated and disfigured our beautiful woods and by what route did it invade our territories? Apparently from Europe, whence have come many of our most injurious insects, and, unfortunately, but few beneficial ones, and probably through the New England States. The first record that I can find of its appearance in the New World is contained in one of Dr. Hagen's "Entomological Notes", (Can. Ent. Vol. XIII., page 37), where he identifies specimens of larvæ, received from Harvard Arboretum in 1880, as agreeing perfectly with the description and figure of *Nematus Erichsonii*. These larvæ, it may be added, had been discovered feeding on European larches, and at first the native larches appear to have escaped.

In Maine in 1882 the spread of the insect was very extensive, and in the same year it occurred in Massachusetts, New Hampshire, and New York, proving that the insects had multiplied and spread with most astonishing rapidity. The United States Entomological Commission made examinations, in this and following years, of the infected districts, and in its very valuable Report on Insects Injurious to Forest and Shade Trees (1890), Dr. Packard gives a full account of the insect and its ravages. In his Report for

1884, he summed up the condition of the larches as follows, and he thinks that the prediction therein contained, was almost verified in 1885: "On the whole, then, while a small proportion of larches have been killed by this worm, this vigorous tree, though defoliated for two successive summers, seems, in the majority of ca es, to survive the loss of its leaves, though it threw out much shorter ones the present summer. Possibly 10 per cent. of our northern larches died from the attacks of this worm. Very probably the numbers of this insect will diminish during the next year, and the species may ultimately become as rare as it has always been in Europe."

The maximum of damage having been committed, and the supply of food having been correspondingly diminished, have probably led to an arrest in the further development of the insects, and their numbers may continue to decrease. It will be, however, many years before the districts ravaged by them regain their wonted luxuriance of vegetation, and the larch forests which they have destroyed will in many instances be replaced by spruces (Maritime Provinces) cedar (Quebec) or other trees which may find the vacated localities suitable for their propagation.

In the paper by the Rev. Mr. Fyles, already mentioned, he gives some figures to show the amount of injury done in the one Township of Bury, in the County of Lennox, Quebec, and an application of these estimates for one square mile, to the extended areas of trees destroyed in the several Provinces, will give some idea of the actual money value of the damages inflicted upon our possessions by this unwelcomed immigrant. "As we have seen, there are in Bury 640 acres of tamarack, giving on an average forty marketable trees to the acre, or 25,600 such trees in all. Every tree contains at least 400 feet, board measure, of lumber. This gives for the whole forest 10,240,000 feet, which, in a sound condition, would have been worth $30,720," at $3 per 1,000 feet on the stump, "and which left standing, would, under favorable circumstances, have been increased in value." He places the total loss to the township at $50,000, and to the adjoining Township of Lingwick at double that sum, and in consideration of the wide extent of the insect's depredations, he comes to the conclusion that "*Nematus Erichsonii* has been the worst insect pest that has ever visited the Province of Quebec." Regarding the re-growth of the trees, he adds: "The tamarack forest of the Townships is a thing of the past. There seems to be a law of nature, that, when one growth of trees is swept away, another of a different kind shall succeed it. The hemlocks and pines of our mountain sides give place to the poplar and the white birch. The tamaracks will probably be succeeded by the American arbor-vitæ, or white cedar (*Thuja occidentalis.*) And, if there were no such natural law, the world is too old, its population too vast, and land in the temperate regions too valuable, for us to suppose that large tracks of lowlands will be left in a state of nature for 200 years to come."

Although this insect has probably come to us from Europe, it is not there the same prolific pest which it has become under the stimulus of our more extensive tamarack forests, a change of climate, and, perhaps, escape from hereditary parasitic foes. It was described and named in 1838, and Cameron gives its continental distribution as Sweden, Denmark, Prussia, Holstein, Harz, Bohemia, Holland and France. The only country in which it is reported as injurious is Germany. In Great Britain "it does not not seem to be a common species. I have only seen a specimen taken by the Rev. T. A. Marshall, of which I do not know the locality. Mr. Dale records it from Glanville's Wootton." Its parasites are given as *Perilissus filicornis* and *Pteromalus Klugii*, Rtz. The former genus has not been recorded from America, but the latter species may possibly be identical with the parasite of which D. Packard bred considerable numbers in 1882, and to which he gave the provisional name of *P. nematicida.*

For descriptions of the insect and further information as to its habits, reference can be made to the excellent paper by Mr. Fletcher in Ann. Rept. No. XV. Cameron states that the male is unknown, and from all the larvæ we have bred there has not emerged a single male. I have, however, one male, taken in a tamarack swamp on the 15th June, 1889, which seems to belong to this species, differing from the female chiefly in having the antennæ, except two basal joints, and posterior legs almost rufous, and the sides of prothorax almost white.

ROSE SAW-FLIES.

A new saw-fly made its appearance this year upon my roses, so that there are now three species attacking these favorite plants. One of these has been known for many years to the lovers of the rose as a troublesome pest, which rapidly destroys the foliage if not promptly looked after. This is *Monostegia rosæ*, Harris, described in 1841 and then placed in the genus Selandria, which has since been sub-divided. Although named in America there is very little doubt that it came from Europe, where it is well known as a troublesome insect, and where several names have been subsequently bestowed upon it. The small stout black flies are abundant in May and June, and the eggs are deposited in the under surface of the leaf, generally near the edge *. The slug-like larvæ feed, at right, upon the upper surface of the leaf and cause it to become brown and withered. In about a fortnight they are fully grown and drop to the ground in which they construct an earthern cell to shelter them until they pupate and emerge the following May or June. There appear to be but two mentions of this saw-fly in our reports: The first by Mr. Gott, of Arkona, in 1878 (Ann. Rept. No. IX, page 57), who stated that it was becoming very abundant and troublesome; the second in my paper on Saw-flies (Ann. Rept. XV, page 70) where its habits are concisely stated.

The second of our pests has not been long known to us, as such, but probably it crossed the ocean many years since, as it was named by Harris about fifty years ago as a new species. This insect is called *Cladius pectinicornis*, Fourc. (*C. isomera*, Harris), and its larva may be called the Bristly Rose-worm to distinguish it from that of the previous species. Dr. Riley, in an interesting article on "Rose Saw-flies in the United States," records this species as first discovered on his rose-bushes (Washington) in 1880 (Insect Life, vol. V, page 7), and it is also several years since I first bred the insect from larvæ taken on a rose-bush in Ottawa, although I cannot find a record of the exact date. I have since bred the species on two or three occasions, and find that it is becoming more abundant. In 1891 I took a specimen at the High Falls on the Des Lievres about 50 miles from the city. The species is apparently double-brooded here (in Washington three-brooded) as the flies appear from May to July. The eggs are laid in the leaf-petioles and hatch in a few days. The larva feeds on the under surface of the leaf, remaining concealed there, and at first making small holes; but these holes increase in size and number with the rapid growth of the grub, and in a few days nothing will remain but the midrib and some of the stronger laterals. The larva is greenish, with an almost orange head and with rows of small warts from which rise rather stiff bristles or hairs †. When fully grown a delicate thin cocoon, with a more or less complete outer one, is spun upon the under side of the leaves or branches, or in rubbish upon the ground. The pupal state of the first brood lasts about a fortnight, but the second brood passes the winter in this form. The flies are considerably larger than those of *M. rosæ* and have the legs and wings paler.

The third species, which has been noticed here for the first time this year, is *Emphytus cinctus*, Linn., of which the larva may be distinguished as the curled Rose-worm, from its position when at rest. This is also a well known European species, which received a new name (*cinctipes*) from Norton in 1867. This species was first reported as a rose pest in America by Mr John G. Jack, who found it very injurious in Boston and Cambridge in 1887 and following years. The eggs are laid singly on the under side of the leaf, but there may be several on a single leaf. The larvæ are [illegible] cylindrical worms, somewhat stouter toward the head, (which is tawny with a black patch on vertex) and are greenish or yellowish-green above and whitish below. They feed on the edges of the leaves until these are consumed, and when at rest are coiled spirally beneath a leaf, or on the stripped stems. When fully grown they are said to generally pupate in the rose-branches, or in rotten wood or pith. Those that I bred this summer, however, buried in the ground in preference to using the pieces of corn pith which I had provided for them. There are probably two or more broods of this species here, as in the United States and

*Cameron states of the European species (*id.*) "The eggs are laid in the month in May," and that "The small oval cocoons are spun in the earth."

†It may be mentioned here that the description given by Dr. Riley does not quite agree with that given by Cameron of British larvæ.

Europe, although I only observed one this year. The worms of this brood finished feeding about the end of June, and the flies (of which I obtained five females and one male) emerged at different dates during July. The flies are about the same size as the preceding species, but may be readily distinguished from them by the banded legs, while the females have also a white band across the abdomen. Although the larvæ were noticed this year for the first time, it may be stated that Mr. Fletcher gave me last winter a male, which had been previously captured by him.

While these three species of saw flies are troublesome and rapidly defoliate neglected plants, they can be quite easily destroyed and kept in check, by a careful spraying at necessary intervals during the season, with a solution of hellebore made by using an ounce of the drug to a gallon of water.

The Pear tree Slug, *Eriocampa (Selandria) cerasi*, Peck.

Slug like larvæ apparently identical with those which have been mentioned in previous Reports, (Nos. V, VI, IX, etc) as attacking pear and cherry trees, were this year very abundant at Ottawa upon Mountain Ash and Cratægus. This worm, Fig. 9, is, when young almost black, or appears so on account of a slimy secretion with which it is covered; the front portion of the body is much enlarged, and the head thereby almost concealed. When fully grown it is almost half an inch long, and after the final moult the color is yellow and the skin is free from slime. There are altogether five moults; the cast off slimy skins adhering to the leaves. The insect feeds upon the upper surface of the leaf, causing at first a small whitish patch, but as the epidermis of the leaf is devoured more and more rapidly with the enlargement of the worm, the foliage of a badly infested tree soon has a dark withered appearance and commences to drop off. Pupation takes place in the ground, in cells lined with a sticky substance, which forms a species of earth-encased cocoon. The species is double brooded; the flies of the first brood emerging about a fortnight or three weeks after the larvæ bury; those of the second not appearing until the following spring. The larvæ were noticed in the summer of 1892, but were much more abundant this year, and greatly disfigured some of the ornamental trees in the city. The attack was most severe upon the variety known as Oak-leaved Mountain Ash (*Pyrus acuparia* var. *quercifolia*) the American form suffering comparatively little. The ravages of this saw-fly, Fig. 10, may be easily checked by spraying either with hellebore or paris green. Although the larvæ were so abundant I have not been able to recognize a single specimen of the fly among my captures, and specimens which I was breeding this summer of the first brood emerged during my absence from home and were so badly moulded as to be unrecognizable.

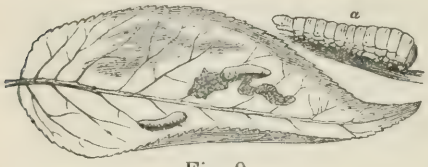

Fig. 9.

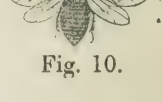
Fig. 10.

The Cornel Saw-Fly, *Harpiphorus tarsatus*, Say.

In *Insect Life* (Vol. II, page 239-243) is an article on "The Dogwood Saw-fly," which supplements a paper which had been contributed to *Garden and Forest* by Mr. J. G. Jack under the title "A Destructive Cornel Saw-fly (*Harpiphorus varianus*, Norton)." As this insect is also found to attack Cornel in Canada a brief mention of it may not be out of place. But before noting its operations I would like to point out that my observations go to show, as I have already indicated (*Can. Ent.* vol. XXV, page 59) that *H. varianus*, Norton, is only a paler form of the species described by Say in 1835 (Le Conte Ed., vol. II, page 679) from Indiana, under the name *Emphytus tarsatus*. *H. versicolor*, Norton, and *H. testaceus* of same author are also apparently forms of the same insect, which is variable in colour. The proper name for the species would, therefore, appear to be *Harpiphorus tarsatus*, Say, with *varianus*, *versicolor* and *testaceus* of Norton as variations, and it may perhaps be better to call it the Cornel Saw-fly, as in some portions of Canada the name Dogwood is not always to these shrubs. The flies appear at Ottawa in June and the early part

of July, and the eggs are then laid in the upper surface of the leaves, the larvæ, when hatched, emerging on the under surface, where they rest coiled up out of sight. During the earlier stages the larva is covered with a white bloom, or efflorescence, which is very easily removed. The head is black, and the feet and under portions yellow. When the last moult takes place the appearance of the larva is greatly changed; it becomes of a bright yellow with rows of black spots along the back and sides, and is no longer covered by the white powdery excretion. Pupation takes place in burrows bored in dead branches, pithy stems, decaying wood, etc., a habit which in some localities is evidently a preservative one, as the land may be flooded for a considerable time in the spring, and if pupation took place in the ground many of the insects would probably perish. The native species of Cornel upon which I have observed them is *Cornus stolinifera*, but at the Experimental Farm they have this year been abundant enough upon *C. sibirica* to be quite injurious. Mr. Fletcher, who has been rearing a number of larvæ from these shrubs informs me that two species seem to be indicated, one being much larger and somewhat different in markings from the other, but until the flies emerge next season this cannot be decided. Under date of 7th Aug., Miss Rye, of Niagara, writes to Mr. Fletcher that the previous week these larvæ had appeared upon her ornamental dogwood trees in immense numbers and had greatly injured them. Upon ornamental plants, however, the depredations of this insect may be easily checked by spraying with the usual Paris green solution.

The Fall Canker Worm, (*Anisopteryx pometaria*, Harris).

The next insect which I desire to mention is by no means a recent intruder, but one which has been frequently brought to the notice of our members and the public at large. I refer to that very destructive insect the Canker Worm, (*Anisopteryx pometaria*). This species, and the very similar *Paleacrita vernata*, Peck, were clearly described for us many years ago by the then President of the Society, Prof. Saunders. (Ann. Rept. VI, p. 26, 1875), and were illustrated by the beautiful figures of Prof. Riley.

Fig. 11.

Fig. 11, represents the Fall Canker Worm *A. pometaria*: *a*, the winged male; *b*, the wingless female; *c*, a portion of an antenna magnified; *d*, segment of larva, magnified.

Fig. 12.

Fig 12, the Spring Canker Worm (*P. vernata*): *a*, the winged male; *b*, the wingless female; *c*, a portion of an antenna magnified; *d*, segment of larva, highly magnified.

It is nearly a century since Prof. Peck, one of the earliest of American entomologists, penned his "Natural History of the Canker Worm," which even then was making itself known as a depredator in the New England orchards. Our two species of moths resemble each other so very closely, both in the larval and adult stages, that the trained entomologist alone can readily distinguish them. This, however, is not a matter of very great importance from the economic standpoint, as the habits of both species are identically the same, and the same course of treatment will destroy the one or the other.

The species are generally distinguished as the spring and autumn Canker Worms, but the larvæ of both species appear in early summer and have the same pernicious habits of reaping where they have not sowed. These larvæ are pale greenish "loopers" when young, becoming more striped and darker with successive moults. Voracious eaters, they rapidly defoliate the trees upon which they feed, and when fully grown they drop, by silken threads, to the ground, to burrow a few inches below the surface and construct a cell in which to pupate, the moths appearing partly in the autumn and partly in the spring.

In his address last year Dr. Bethune made mention of the abundance of Canker Worms at several places in Canada, one of these being Ottawa. Having watched the

appearance of the pest during the past three seasons, I wish to make a few remarks upon the species which has been the cause of so much disfigurement of our shade and forest trees. The past summer was the third in which the attack has been severe, but there are indications that the crisis has been passed and that we shall probably next year have a less numerous host at work. The species which has been infesting our district is that known as the Fall Canker Worm, *A. pometaria*, and I am informed by my friend Mr. Fletcher, who has a fuller knowledge of the lepidoptera, that the other species (*vernata*), does not occur here.

While a variety of trees have been more or less injured, it was easily observed that the basswoods were one of the favorite objects of attack, and the large succulent leaves of this densely foliaged tree were speedily riddled, and entirely eaten away by the swarms of caterpillars. In 1892 the ash trees suffered very much, and in many localities were also almost defoliated. In one locality especially, where some fine trees grew on the margins of a low meadow, the excrement dropped by the feeding swarms pattered like a heavy shower on the ground beneath, and walking beneath the trees was rendered most unpleasant on account of the scores of dangling worms, fallen from aloft and swinging to and fro on their silken lines. One soon got liberally sprinkled with worms, and at the same time had the unpleasant sensation of the threads across his face like so many strong cobwebs. The caterpillars which had fallen were of course anxious to return to the feast, and could be seen crawling upward upon every trunk. A natural result of this upward movement was, that all that got on one's clothing soon reached the collar, where they circled around in a most disagreeable manner seeking a way to go still higher, and liable to be crushed by any movement of the head.

This year the attack in that locality was much lessened, either through the influence of predaceous and parasitic enemies, or by flooding of the ground in the winter and spring. Groves of hickories (*Carya amara*) on the higher land adjoining, were pretty well defoliated, but here the Canker Worms were assisted in their work of destruction by several other species of caterpillars. The Canker Worms were most abundant during the first week of June, but by the 20th they were mostly finished feeding and had dropped to the ground. During the period of their presence upon the trees I tried to

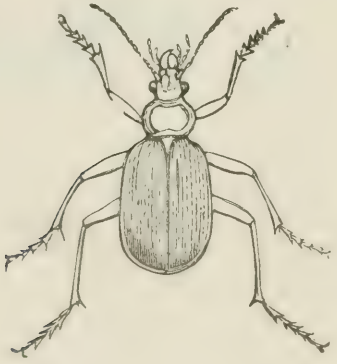

Fig. 14.

observe as often as possible the enemies by which they appeared to be attacked, and it has been encouraging to find that some of these have increased rapidly in numbers, concurrently with the increase of the worms. This has been especially noticeable in the case of the fine beetle *Calosoma frigidum*, Kirby, which belongs to the same section of the genus as *C. scrutator*, Fig. 13, and *C. willcoxi*, the beautiful large green beetles which occur plentifully in some parts of Ontario, but whose range does not extend as far eastward as Ottawa. The tree climbing and larvæ-seeking habits of these splendid insects are well known, and *frigidum*, which has a more northerly and easterly distribution, appears to have the same arboreal and predatory habits. Our other common species, *C. calidum*, Fig. 14, is essentially a ground beetle and is a most persistent destroyer of cutworms. While

frigidum has the more graceful shape of the *scrutator* group, it is quite black, and bears three rows of small bronzed or greenish punctures, which are, however, much less conspicuous than those of *calidum*.

As an evidence of the rapid increase of *frigidum* during the recent infestation of Canker Worms, it need only be mentioned that my first capture of this beetle was on 23rd May, 1883, on an island about three miles below the city, and that no other specimen was taken by me until 28th June, 1891. During these eight years a careful watch had been kept for this species, and many additions of less conspicuous beetles had been made to my local lists, so that I was forced to the conclusion that it was one of our rarest species. In 1892 however, as recorded in *Ottawa Naturalist* (Vol. VI., p. 150), I found several specimens in a locality where the Canker Worms were very numerous upon ash trees, and also took two specimens in the city. This spring the beetles were found to be quite abundant under stones etc., in the infested localities, and later when the worms made their appearance on the foliage they were soon attacked and greedily devoured by the beetles. Numerous examples of *frigidum* were seen ascending the trunks of the basswoods and extending their investigation as high as they could be watched. The worms seemed to be easily disturbed by the marauders, and when a beetle ran out on a leaf they would drop down a few inches to elude it. One of the less alert, or newly moulted worms, would, however, be captured, and it took a very few seconds for the beetle to devour the juicy body of its prey and to recommence the hunt. Enormous numbers of the worms must have been thus devoured by this beneficial beetle. At the Experimental Farm, the beetle was also found in some numbers on infested basswoods, showing that its range was becoming more extended.

The Canker Worms were also attacked by parasitic hymenoptera, which, though less conspicuous, may not have been less destructive than the beetles. One of these which I have bred is apparently *Apanteles palacrita*, a Braconid, described by Prof. Riley, (Trans. St. Louis Acad. Science, Vol IV., p. 318), from 3 females 1 male, bred from the larvæ of *Palæcrita vernata*, found at Villa Ridge, Southern Illinois, the flies appearing May 10 h, and from 2 females bred from Canker Worm larvæ, probably of the same species, received from Mr. J Pettit, Canada West. This Apanteles differs from *A. congregatus* and other common allied species, in that the host only supports a single larva, which, however, seems to so exhaust its vitality that it does not reach maturity. Dr. Riley says that: "The greenish white cocoons are spun singly on the under side of a leaf," but I have often found that the parasitic grub, when satiated with the juice of the unfortunate Canker Worm, emerges from its back and spins its cocoon thereon; the emaciated worm bearing this upright burden, like a tower on his back, wanders feebly about until death claims and relieves him.

On the hickories I found numbers of the Canker Worms which had succumbed to a different internal parasite, and had become more contracted and stiffened shells, attached to the leaves and stems on which they had died. Such a condition results with some caterpillars from the attacks of species of the Ophionid genus Limneria, and perhaps may have so resulted in this instance, but from a number of specimens collected I bred invariably a species of Hemiteles, the members of which genus are considered secondary or hyper parasites. I have not yet had time to thoroughly identify the pretty little species bred from the Canker Worms, but it resembles *H. maculipennis*, Prov., in having two well defined bands on the wings, although evidently a distinct species, and closely related to *H. melitæe* Ashm., if not identical with that species, which occurs in California. Another Ichneumon which was quite common about the infested hickories was the handsome *Mesostenus thoracicus*, Cress., usually a rare insect, and I supposed from its unusual abundance that it was parasitic on the Canker-worms. After closely watching their movements, however, I ascertained that they were searching for the rough cases made by a species of leaf folding caterpillar, and that they perhaps confined their attention to this species which was somewhat abundant. I collected some of the folded leaves and bred from them both the parasite and the moth, the latter a pretty little species, which Mr. Moffat has kindly identified for me, and of which he says: "The moth is *Ambasa Walsinghami*, Rag, as identified for me by Prof. Fernald from a single specimen taken at Hamilton several years ago, and I have never met with another. It belongs to

the Phycitidae and Hulst gives its habitat as Cal., but gives no intimation of its food plant." In addition to this insect and the Canker-worm, there were several geometrid and other larvæ infesting the hickories, but I had not the time to collect or examine them.

While the Canker-worm is a very destructive insect, it fortunately does not extend

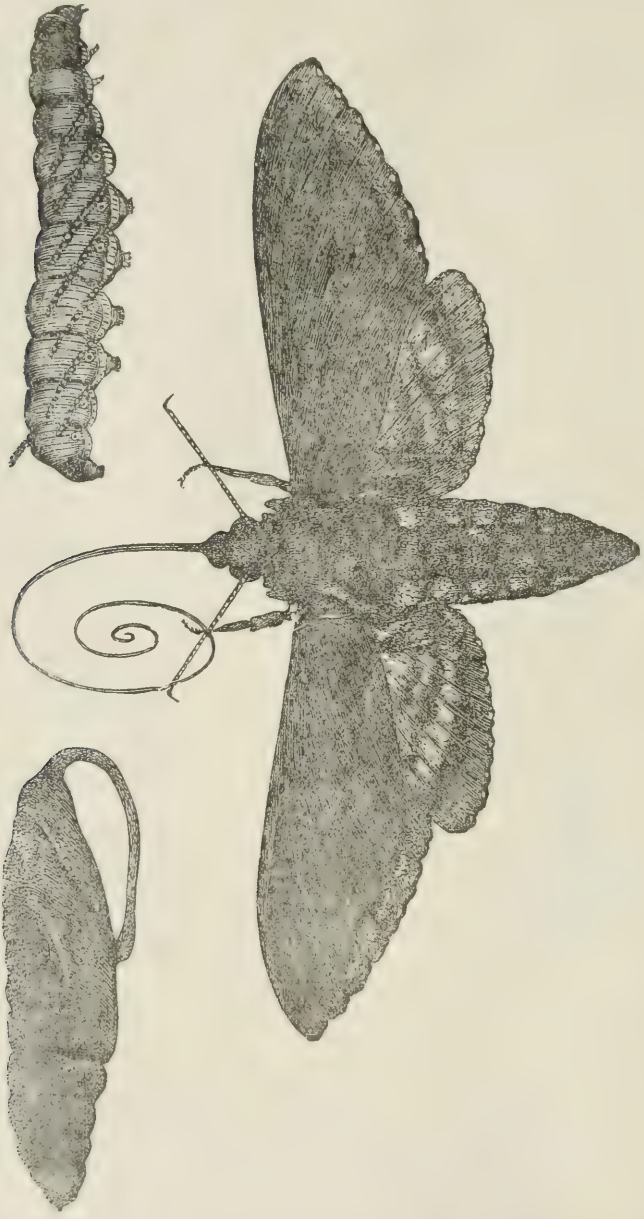

FIG. 15.

the area of its ravages very rapidly, as the females are wingless, and generally deposit their eggs upon the trees beneath which they have emerged from the ground where the caterpillars buried for pupation. The insect is thus not a difficult one to deal with when it infests the orchard or shade trees. The females may be prevented from climbing

up the trunks by means of sticky bands or funnel-shaped collars of tin. When thus stopped they often deposit their eggs below the obstruction, where they may be easily scraped off or destroyed by brushing with coal oil. When the attack is not observed until the worms are feeding, they may be sprayed with Paris green (one pound to 200 gallons of water), or may even be jarred from the trees and then destroyed. If they have been allowed to become full grown, and have buried themselves, plowing to the depth of a few inches, late in the autumn will expose them to the frost. The spraying of the trees when the young larvæ are feeding is the most effectual means of destroying the insects.

Miscellaneous Insects.

The Tomato-worm, the large caterpillar of the Hawk moth, *Sphinx quinquemaculata*, Fig. 15, which last year was reported in some portions of Ontario very destructive to both tomatoes and potatoes (Fletcher, Rept. Exp. Farms, 1892, p. 161), has not proved so troublesome this season. The decrease of this obnoxious caterpillar may be largely due to the increased abundance of the little Braconid fly, *Apanteles congregatus*, with the little white cocoons of which the worms may be sometimes found almost covered, as many as 200 larvæ of the parasite feeding and developing in one caterpillar. The Fall Web-worm, *Hyphantria cunea*, Fig. 16, continues to be very abundant, and its unsightly webs disfigure a great many trees throughout the country, although there is no reason why its ravages should be permitted in gardens, orchards or lawns, where a little care in removing the colonies of young worms would soon greatly reduce the pest. In the Maritime Provinces it seems fully as common as in Ontario and is one of the most noticeable insects.

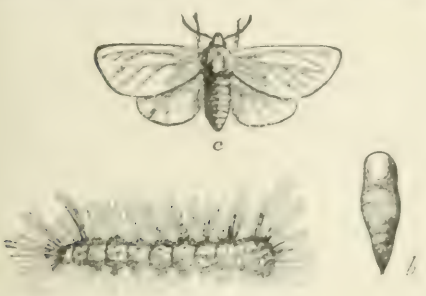

Fig. 16.

The handsome "Mourning Cloak" butterfly, *Vanessa Antiopa*, whose rich purple wings are broadly margined with golden yellow, has been in unusual abundance this year, and its black spiny caterpillars have seriously defoliated the elms and willows. Because of its beauty and of the cheerful appearance it makes in the early days of spring, we can forgive this species for a considerable portion of its depredations. It is also so subject to the attacks of a small parasite, *Pteromalus puparum*, of which a single chrysalis contains hundreds, that its increase is kept well under control without the interference of man. Another beautiful butterfly which was unusually abundant, was *Limenitis Arthemis*, which has a most charming garb of purple, variegated with shimmering blue and broadly banded with white. It is a woodland butterfly, flitting gracefully along the paths through woods or about their margins, and thus hiding its beauty from the city residents, whereas the more hardy Antiopa enjoys both city and country life.

Plant-lice of various species are a continual source of trouble and loss to plant growers and fruit raisers, and the Apple-aphis may be cited as one of the more injurious species. Another plant-louse has badly infested the ornamental shrub known as Snowball, and much disfigured them by curling and shrivelling the leaves. The attacks of such insects can be easily treated with a spraying of the kerosene emulsion recommended by Mr. Fletcher, in Bulletin 11, Central Exp. Farm, which tells how to prepare and apply the most efficacious remedies for many injurious insects.

Several species of beetles have come under my notice as having been injuriously abundant during the year. Among those were two of our common Blister-beetles—*Macrobasis unicolor*, the Grey Blister-beetle, Fig. 17a, was reported as infesting potatoes,

a crop which is not infrequently attacked by this insect, and in New Brunswick it was also found destroying horse-beans, which are now being somewhat extensively grown with corn for ensilage. The favorite native food of this beetle appears to be the Meadow-rue (*Thalictrum cornuti*), but it is also quite satisfied with the foliage of the Basswoods. The Black Blister-beetle, *Epicauta pennsylvanica*, Fig. 17*b*, has been reported infesting German asters and mangels, and has been previously known as attacking carrots, cabbages, and beets. The method of attack by these two species of Blister beetles is much alike, and they sometimes may suddenly appear in very great numbers. Their depredations need not, however, be much feared, as they are only committed by the adult, or fully developed insects, and are of comparatively short duration. They may be readily checked by dusting with lime or plaster, or in extreme cases by sprinkling with paris green. In the larval stage the Blister-beetles are parasitic in their mode of life and some of the species render good service in destroying the eggs of grasshoppers. In Manitoba and the N. W. Territories a larger species, *Cantharis Nuttalli*, is very abundant, and at times troublesome, and one or two species have been recorded as pests in British Columbia.

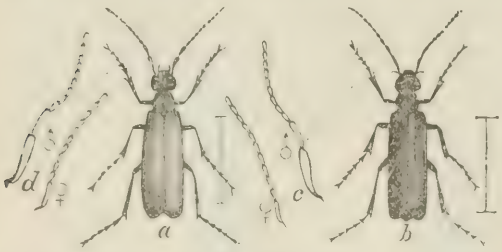

Fig. 17.

The Spotted Tortoise-beetle, *Chelimorpha argus*, Licht, was brought to me several times as a destructive beetle, but its presence on some of the plants said to be attacked was undoubtedly accidental. The larvæ of this beetle feed, in common with those of our species of Helmet beetles (Coptocycla) on the common wild convolvulus. They are disagreeable looking spiny grubs, carrying their cast-off skins upon their backs like a bundle of old clothes. Before pupating, if their food plant has been pretty well destroyed, they may wander off and attach themselves to adjacent plants. They have been said to feed on potato, and on raspberry, but, if these were carefully made observations, it is probable that the proper food plant had been exhausted, and the larvæ had sought the nearest plants. The Morning-glory, which belongs to the Convolvulaceæ, is subject to their attacks, and one instance came to my notice this season, in which serious havoc was made with the form of this creeper known as the Rose of Sharon.

In the Maritime Provinces the Pear-blight Beetle, *Xyloborus dispar*, which belongs to the Scolytidæ, or family of small bark-borers, continues to cause much alarm to the proprietors of the famous apple orchards, as it appears to attack healthy trees as well as those whose vigor has been impaired. If it continues to spread, this minute beetle will be the source of much loss, and will be extremely difficult to combat.

Grasshoppers, which two years ago were unusually abundant and destructive, especially in oat-fields, in this section of country, were, probably on account of the very wet spring and summer, much less numerous this season and comparatively harmless. In the western parts of the Province, as for instance in the neighborhood of Lake Simcoe, where dry weather prevailed, they proved very destructive; the season being favorable to their development, while at the same time reducing the vigor of the plants subject to their ravages. The three common species occurring were *Melanoplus femur-rubrum*, *M. atlanis*, and *M. femoratus*.

The Cattle Horn-fly, *Hæmatobia serrata*, has continued to extend its area during the past season, and has undoubtedly caused a very serious loss to the stock-raiser and dairyman. While the animals may not be dangerously or permanently injured by its attacks, the irritation is so great that sores are produced by the rubbing and licking by which they strive to relieve it, and the general effect is to cause the beasts to "fall off rapidly both in flesh and in yield of milk." For further information regarding this recent and serious pest, I would refer you to the excellent paper by Mr. Fletcher in our last Annual

Report, or to his Bulletin on the Horn-fly (Central Exp. Farm, No. 14.) As the dairy and stock-raising interests of Canada are of such great importance it is sincerely to be hoped that this plague of flies is but a temporary one.

Parasitism in Insects.

This, to me, is one of the most interesting problems in entomology, and the subject has been admirably dealt with by Prof. Riley, in his address as President of the Entomological Society of Washington last year (Proc. Ent. Soc., Wash., Vol. II., pages 397-431). After a mention of the animals affected (chiefly mammals, birds and insects), he defines the scope and meaning of the term parasite, and suggests the separation of parasitic forms into three groups. First, *Parasites Proper*, including insects whose whole life is passed upon and is dependent upon their host, and which may be subdivided into *external*, as lice, and *internal* (or subcutaneous), as the itch mite, etc. Second, *Fatal Parasites*, which, in the larval stage, live at the expense of the members of their own class. These are also subdivided into *internal*, where the larva is nourished within the host upon the surrounding fluids, as are the majority of Hymenopterous parasites, and *external*, where the larva attaches itself to the host, as in Thalessa, and sucks its juices; to this subdivision belong many hymenopterous, dipterous and coleopterous parasites. Third, *Inquilinous Parasites*, which includes the numerous forms which live upon the provision made by other species for the sustenance of their offspring, or which are found habitually associated with other insects, but not injurious to them. This class is subdivided into *fatal inquilines*, where the guest's living means starvation and death to the host, and *commensals*, where association is mutually harmless, as where beetles are found living in the nests of bees and ants.

An outline is then given of the parasitic forms occurring in the several orders of insects, with reference to some of the principal and more interesting groups. The Hymenoptera furnish by far the greatest number of species, which, by their abundance and rapidity of reproduction, tend to check and reduce the undue prevalence of other insects. Some of the most interesting parasites belong to the Coleoptera, especially those forms of which the larvæ in the first stage are named triungulins, and which later, when the host has been reached and food assured, gradually become helpless grubs. Such are the Oil-beetles and Blister-beetles in the larval stages. The Diptera furnish the well-known Tachinid flies which deposit their eggs upon caterpillars and other insects, the footless maggot penetrating the body of the victim and feasting therein. These forms are very numerous and destroy enormous numbers of insects, such as the Tent-caterpillars, etc. The order furnishes also many other important groups of parasitic species varying much in habits, such as the bot-flies and tick-flies. We may also include under this order the fleas. In the Hemiptera are found the true lice, unpleasant little creatures, subsisting on the blood of mammals and not even exempting man, especially if he be indifferent as to cleanliness of body and raiment. The bed bug is often spoken of as a parasite, but is so, to such a limited extent, as not to fall into any of the classes enumerated, being merely predaceous in habit, a distinction which should be born in mind, as there are many predaceous insects which do not come under the stigma of parasitism.

The Platyptera (bird-lice) and Arachnoides (Ticks and Mites) contain numerous species, principally external irritants, but the remaining orders of insects are almost free from any parasitic inclinations.

The causes which might produce the parasitic habit are then considered, and the effects of the parasitic life, which produces degradation both by limiting the freedom of motion and by obliterating structural features common to closely allied non-parasitic forms, although at the same time certain organs may gradually become highly modified and specialized to meet the requirements of the new conditions of life. The modifications observed are both external and internal, and form in themselves an extensive subject for consideration. Finally the economic bearing of parasitism is briefly referred to, and it is shown that the agriculturist is very greatly aided by the numerous species which subsist upon phytophagous insects. The address is one well worthy of careful study, and, as has been elsewhere remarked, would serve as a basis of a very acceptable volume.

Entomological Publications.

The study of Entomology from an economic standpoint, has, of recent years, been rapidly developed in America, and the Association of Economic Entomologists, organized to bring together the workers in this field of applied science, must exercise a powerful influence upon future investigations of this nature. The agriculturist will have no excuse, for remaining in ignorance of at least an elementary knowledge of his insect enemies when the results of the investigations of trained entomologists in every section of the country are so frequently and freely issued in bulletins and reports.

In Canada our Society has been a pioneer in this direction, and for more than a score of years has issued an Annual Report, which is generously distributed by the Ontario Department of Agriculture. In more recent years the Dominion Government has sought to assist and develop the agricultural interests of the various Provinces and Territories, by the establishment of Experimental Farms. These are under the direction of Prof. Saunders, for several years President of this Society, who is well-known as a writer on economic entomology, and especially by his able treatise on Insects injurious to Fruits, which is a standard text-book for fruit-growers throughout America. He is fortunate in having associated with him, as Entomologist and Botanist, Mr. Fletcher, who has also been more than once our president, and whose industry and scientific acquirements render him unusually well-qualified to occupy such a difficult and responsible position. His yearly reports and occasional bulletins are replete with information clearly and concisely expressed, and, as they are gratuitously supplied to applicants interested in these subjects, it is unnecessary for any one to suffer insect depredations to go unchecked.

In the United States the Division of Entomology at Washington, under the guidance of the most eminent of all economic entomologists, Prof. Riley, assisted by a staff of numerous trained and skilful observers, conducts most thorough investigations in all parts of the country where any pest attains unusual prominence. The publications, based upon these researches, are most valuable and reliable records of the habits of injurious species, the parasites from which they suffer and the remedies which may be most easily and effectually employed against them. A complete series of the publications issued up to date forms in itself a very valuable library. The Smithsonian Institution, in the Bulletins of the U. S. National Museum and other publications, affords to authors a means of issuing more extensive and exhaustive monographs than could be received by the regular entomological journals. Among recent issues from this great source of scientific knowledge may be mentioned the Directions for Collecting and Preserving Insects, by Prof. Riley, which is the most complete and satisfactory text-book known to me on a subject which forms the basis of all entomological study and advancement. A larger work, although appealing to a more specialized and limited class of readers, is Bulletin No. 44, in which Prof. John B. Smith gives a further proof of his untiring energy and ability in a Catalogue of the Lepidopterous Sub-family Noctuidæ, found in Boreal America, forming a volume of 400 pages.

The various State Entomologists, Agricultural Colleges and Experiment Stations swell the tide with reports and bulletins. It would take too long to enumerate even the most important of these, but mention may be made of the many valuable reports of Lintner, Comstock and Forbes, to indicate the character of the work accomplished by such professional workers in the wide field of economic entomology.

The general literature relating to insects increases with great rapidity, and the yearly additions are so voluminous as to be almost discouraging to students who desire to have, or to know, all that is being published. The record of entomological writings of 1892 (Insecta ; Dr. Sharp) gives over one thousand titles of papers. It is scarcely possible for any of us to obtain, or even see, all these writings, however much we may desire to possess, or, at least, to peruse them, but a certain number of publications are necessary if we desire to obtain a knowledge even of our own fauna.

Of these, *The Canadian Entomologist*, now completing its twenty-fifth volume, is the most essential to Canadian students, and, although dealing more especially with the insects of our own dominions, it contains many valuable contributions from wider fields, by the most noted entomologists of the day. Under the careful editorship of our late President, Dr. Bethune, it shows a steady improvement in quality and quantity of matter, and

(started Aug. 1868) enters promisingly upon its second quarter of a century. This is the only Canadian journal devoted to Entomology, but the *Ottawa Naturalist*, published monthly by the Ottawa Field Naturalists' Club, frequently contains valuable papers and reports on the insects of the surrounding section of country. Occasional entomological contributions also appear in the *Canadian Record of Science*, and possibly in the transactions of other societies.

Of the United States' periodical publications the most important are as follows: Transactions of the American Entomological Society; *Psyche*, issued by the Cambridge Entomological Club; Proceedings of the Entomological Society of Washington: *Entomological News*, by the Academy of Natural Sciences, Philadelphia: *Insect Life*, by the Division of Entomology, Washington, and the *Journal of the New York Entomological Society*, which has recently made a brave and promising entry into the arena.

While the more advanced student may be embarrassed by the wealth of entomological literature provided for him, the beginner has hitherto found the information most needed not to be readily obtained. He has had to seek here and there a little, like the bee gathering honey, and has lost much valuable time in the search, as does the bee when flowers are scattered. A new era seems to be now opening, and the long road is being cleared and smoothed for him. Dr. Riley's directions for collecting and preserving insects enable him to prepare good specimens and to form satisfactory collections, and by the aid of Dr. Packard's "Entomology for Beginners," or Prof. Comstock's "Introduction to Entomology" (Part I. only issued) he can study their structure and classification. The next stage, the identification of specimens, without having to impose upon more advanced students the labor of naming even the commonest forms, promises soon to be covered by the issue of hand-books on the various orders, in which will be gathered generic and specific descriptions, now often scattered in foreign and miscellaneous literatures, accessible but to the favoured few.

Such a help to the determination of the diurnal lepidoptera has already been issued by Dr. Scudder, under the title of "A Brief Guide to the Commoner Butterflies of the United States and Canada." The introductory chapters narrate clearly and concisely the structure and habits of butterflies, and are followed by carefully arranged tables for readily determining the species. The omission of rare forms makes these tables less complicated without lessening the value of the work to the young students for whom it is specially intended. Each species is fully described in its several stages, and interesting facts are added in regard to its habits of life. Those who may consider themselves too far advanced to profit by this valuable little book will await with interest the author's promised "Manual of the Butterflies of North America." From the same facile pen we have also a charming little volume for the general reader, on the Milk weed Butterfly, simply written and devoid of technicalities, yet giving not only the life history of the species selected as a type of our "winged flower," but much of interest in regard to its tribe.

The *Journal* of the New York Entomological Society informs its readers that the preparation of a Hand-book of Coleoptera found in North-eastern America is contemplated, and is now publishing a preliminary catalogue of the species, compiled, from printed and manuscript lists of various entomologists, by Messrs Laugand Bentenmuller, who express the hope that they may be notified of any corrections or additions tending to perfect the catalogue. When this hand-book appears the Butterfly and Beetle collectors will be well equipped, and the students of the remaining, equally important if less generally attractive, orders will await the preparation at a later date of manuals to meet their needs.

In conclusion, I have to express the great degree of satisfaction derived from the knowledge that our Entomological Society continues to find itself in a healthy and progressive condition, and to apply itself faithfully to the study of those minute rather forms of life, which, though individually minute and feeble, are in the aggregate a very important factor in modifying the conditions of existence of even man himself. Upon each fellow-member I would urge the necessity of constant work in some selected section of the great field of Entomology, for only by untiring effort, and often by considerable self-denial, can we master its problems and utilize our investigations for the benefit of others. I shall gratefully remember the honour, which I have this year enjoyed, of having been the chief officer of this important Society, and shall strive in the future, as in the past, to assist in its labors.

ENTOMOLOGICAL MISTAKES OF AUTHORS.

Rev. Thomas W. Fyles, F.L.S., South Quebec.

I lately took up Gage's Second Reader, authorized for use in the schools of Quebec, Manitoba, British Columbia and the North West Territories; and I opened it at the chapter entitled "How a Butterfly came." I was curious to know the value of the lesson in Natural History provided in this authorized work for the children of the provinces and territories named; and I read it carefully. The lesson tells that

"Late in September a lady saw a worm upon a willow leaf."

The worm is described; and a rude cut of it is given.

"The lady carried leaf and sleeper home. She took willow leaves for it to eat, put them all in a glass dish, and tied lace over it. In just one week her guest was gone; only a lovely green bag was left."

Here the bag is represented.

"It was just one inch long, was made very neatly, and looked much like a little bed or cradle. No stitches could be seen, and the seams had an edge like gold cord. Gold and black dots like tiny buttons were on it. The caterpillar had sewed himself in." . . . "Almost six weeks the little sleeper lay in his silken cradle. Early in November he burst the pretty green hammock." . . . "A lovely butterfly came out out. It had brown and golden wings, with stripes of black like cords on them, and a feathery fringe of white for each stripe. On the edges of the wings were white and yellow dots. The head was black and also had white and yellow dots on it."

Here comes a representation of a butterfly—decidedly a *Papilio*.

"The inside of the wings was darker; it was like orange-tinted velvet. All these changes were in less than two months."

The caricatures of the larva and pupa given, and the descriptions of the insect in its different stages, are faintly suggestive of *Danais Archippus*; but Archippus feeds on *Asclepias*; and Archippus is not a *Papilio*. *Papilio Turnus* is, I believe, sometimes found on the willow; but the description and the cuts of larva and pupa are not even *faintly* suggestive of this species.

What insect is really meant in the lesson I am quite unable to determine; but this I can with confidence say: The Canadian child, who may be led by this chapter in the Second Reader to search the willows late in September, for banded worms two inches long, that will in a few days sew themselves into silken bags, out of which, in November, swallow-tail butterflies will come, will simply have its labor for its pains.

This wonderful lesson in Entomology upon "How a Butterfly Came" set me "a-thinking," and led me to make various mental and literary excursions. For example: I have accompanied poor "Tom" in Charles Kingsley's "Water Babies" to the "other-end-of-nowhere," and sat at the feet of "Mother Carey," and learned from her that the fairy who made butterflies was not nearly so clever as the fairy "who made butterflies make themselves." This lesson, I take it, was intended for a sly joke at the evolutionists, and suggests the question, How did the butterfly and other insects originally come?

The Egyptians told Herodotus that some living things were generated from the slime of the river and the sea; Pliny supposed that insects sprang from the dew falling upon leaves; Virgil thought that bees might spring from the corrupting bowels of slain beasts; Pietro Martire that "gnattes of divers kindes" were "ingendered of moyste heate"; Ashmole assured Pepys—at any rate Pepys tell us so in his "Diary" under date of April 23rd, 1661—that "many insects do often fall from the sky ready formed;" Swedenborg taught that worms are "procreated from the effluvia of the earth, and from the exhalation of vapors of vegetables, by which the atmospheres are impregnated;" and Du Bartas that God

> "By his wise power made many creatures breed of lifeless bodies . .
> So the cold humour breeds the salamander . . . . .
> So, in the fire, in burning furnace springs
> The fly Perausta."

All these worthies were mistaken—as much so as a very modern *savant* in the person of a little school-boy, who a few days ago told me gravely that "if I would put a horse-hair

into the water and keep it there, it would turn into a snake." He did not make a disciple of me, for I had read Cobbold's, Leidy's and Agassiz's observations on *Gordius aquaticus*, etc.

I have come to this conclusion that whether we go to the "other-end-of nowhere," or to "the uttermost parts of the morning," we shall find nothing better to rest upon than the old statement, "God said, Let the earth bring forth the living creature after his kind, cattle, *and creeping thing*, and beast of the earth after his kind; and it was so." Gen. I, 24.

That every kind has its own well-ordered and fitting life-history we are assured, from the success that has attended the efforts of entomologists in following through their various stages of existence many of the most minute and obscure of living things.

I have shewn that an authorized school-book may be misleading—the school master's desk is not *always* the seat of entomological authority.

From the pulpit too, hard sayings sometimes reach our ears

In the language of the ancients, as you know, the word Psyche meant both *a butterfly* and *the soul*. And in ancient art an association of the two ideas was embodied, in a figure of a beautiful damsel holding an expiring torch in one hand and a butterfly in the other. In this manner, the soul escaping from the worn-out body was portrayed. Christian writers have endeavored to improve upon their imagery, and in doing so have erred. They have compared man's earthly life to the caterpillar state of the insect, the tenantless body to the aurelia, and the future glorified body to the imago of the insect. In all this there is an evident straining of the analogy. The apostle St. Paul, to illustrate the great doctrine of the resurrection, said: "Thou fool that which thou sowest is not quickened except it die" (I Cor. XV, 36). But under normal conditions an insect does not die in the aurelia stage—death with it is the final scene—and so we never find the inspired writers making use of the metamorphoses of insects to illustrate that great doctrine.

One quotation from a modern writer will show at once, and better than a long argument, the inappropriateness of such illustrations. In the 2nd vol. of "Sermons for the Christian year" by the Rev. William H. Lewis, D.D., Rector of Christ Church, Watertown, Conn., page 312, we read:

"We stand by the sedgy pond, and see dark forms of water-insects skating along, that could not live a moment if they were taken in that state out of the waters, just as we could not bear with such bodies as we now have the life of heaven; but by and by these insects" (appear) "to sicken and die, and lie motionless for a while, and then a creature rises to the surface, climbs up some reed or flag, and does itself awhile in the sun, and then flashes through the air, with the splendid wings of the dragon fly, perhaps. Now could it live in its old home in the waters any more; just as man raised in his spiritual body will no longer be fitted for such life as he now lives on earth. It is an emblem of the resurrection—a creature of one world, or element, passing by decay and seeming death to another."

Unfortunately for this illustration, the nymph of the dragon fly is both active and predaceous, and carries on its pursuits until the very hour in which it ascends the stem of a water plant, or other prominence, from which, as from a vantage ground, as soon as its outer skin is ruptured and cast off, the transformed body takes its flight to pursue its depredations in the upper air.

The illustration is a very unsavoury one. The Libellula is a terror to its neighbours in every stage of its existence; and surely the man who has "bulldozed" his fellow creatures in this world can hardly be warranted in indulging in blissful anticipations of doing the same in the world to come.

The giants among men of letters, the great masters of song and others, who in the strength of genius have trusted to their own observation, have sometimes, by a word, brought before us peculiarities of insect form or habit recognizable in all time. Thus Homer speaks of the *ringed* wasps; Shakespeare of the *mealy* wings of butterflies; Rogers of the glow-worm's *emerald* light; Shelley of the *golden* bee; Tennyson of the "*high elbowed* grigs that leap in summer grass." Even Horace's "*mali* culices" strikes the musquito-bitten entomologist as singularly appropriate.

But lesser lights who have given rein to fancy, or have imperfectly interpreted the phenomena of nature, have often greatly blundered in treating on entomological subjects.

The entomological mistakes of writers have arisen:

(1) *From sheer ignorance.*—This was the case with the man who translated the pas

sage in the Greek Testament, which tells us that Herod was eaten of worms (*scholeches*, larvæ) and died,* by "He became a Skoletobrote, and died in the enjoyment of that office."

Such also, as regards Natural History, was the case with Bp. Oxenden, when on page 70 of "My First Year in Canada," he wrote:

"The little humming-bird is rather rare, and they are seldom seen but in gardens. They are more like butterflies or gad-flies than birds both as regards their size and habits."

From this slovenly statement we may fairly make this deduction: Since the humming-bird resembles, both in size and habits, the butterfly or the gad-fly, these insects in the same particulars and to the same extent, resemble one another. A somewhat startling entomological conclusion! A lady whom I know, having read the Bishop's book, still speaks of the ruby-throated humming bird as *the Canadian gad-fly*.

Bulwer Lytton makes a remarkable mistake from sheer ignorance of entomology. He describes one of his heroines as a lady of refined tastes, who kept living butterflies in her conservatory. *Some of these she allowed to escape after they had been confined for a year.* ("Kenelm Chillingley," Bk. V., ch. 5). The veriest tyro in entomology knows that the preservation of a living butterfly for a year would be miraculous. Lytton made a new departure in his statement. The usual tendency of authors has been to shorten the insect's life. Thus Mrs. Barbauld very elegantly says:

"Lo! the bright train their radiant wings unfold,
With silver fringed and freckled o'er with gold.
On the gay bosom of some fragrant flower,
They idly fluttering *live their little hour*,
Their life all pleasure and their task all play,
All spring their age, and sunshine all their day."

Another mistake frequently made in ignorance by authors is to portray the butterfly's life as one of unalloyed pleasure. Spenser says of the butterfly that—

—"evermore, with most varietie,
And change of sweetness (for all change is sweet),
He casts his glutton sense to satisfie
Now sucking of the sap of herbe most meet,
Or of the dew, which yet on them doth lie;
Now in the same bathing his tender feet,
And then he percheth on some branch thereby
To weather him, and his moyst wings to dry."

* * * * * * *

"What more felicitie can fall to creature,
Than to enjoy delight with libertie
And to be lord of all the works of Nature?
To reign in the aire from th' earth to highest skie,
To feed on flowers and weeds of glorious feature,
To take whatever thing doth please the eye?
Who rests not pleased with such happiness,
Well worthy he to taste of wretchedness."

Commenting on these lines, Leigh Hunt wisely says:

"After all, Spenser's picture of the butterfly's enjoyment is not complete entomologically. The luxury is perfect, but the reader is not sure that it is all proper butterfly luxury, and that the man does not mix with it. . . . "The butterfly perhaps is no fonder of 'bathing his feet,' than we should be to stick in a tub of treacle. And we ought to hear more of his antennæ, and feathers (for his wings are full of them), and the way in which they mollify, or become affected by his enjoyments."—*The Indicator*, ch. LXIV.

The lines are beautiful, but the picture they present of insect delight is altogether overdrawn. St. Paul had a much better appreciation of things when he said, "The whole creation groaneth and travaileth in pain together until now," (Rom. viii., 22). We who have studied insect life can tell of the foes that beset it from its earliest stage to its final scene; the Proctotrypidæ that spoil the eggs; the Ichneumonidæ and Chalcididæ that assail the larvæ; the life-sapping fungi that destroy both larvæ and pupæ; *Phymata erosa* that lies in wait for the perfect insects in the very flower heads that attract them; the Dragon-flies, the Vespidæ, the Orabonidæ, that (as well as the insectivorous birds) pursue them in the upper air, all these form a terrible array of adversaries. Then there are to be borne the dark hours that curb their faculties, the rains that wash away their

*Kai genomenos skolekobrotos exephuxen.—Acts. XII, 23.

beauty, and the winds that wear and fray their wings. In the case of the Vanessidæ and Graptidæ there are the terrible torpidity into which the winter chills them, and what I imagine to be no less terrible, the partial awakenings on intervening milder days.

No greater contrast to the picture presented in the fine verses of Spenser can be shown to us than the *reality*, when in the early spring, a pair of hibernated Graptas—*Grapta Progne*, for example—perform their nuptials. Worn and dilapidated, the bloom and glory of youth swept away from them by winter storms, they furtively and in contradiction to the very name they bear (*Progne*, a swallow, one that shuns the woods), seek the shades and safeguards of the trees, whose lichens and mosses resemble in colour their own sober hues, and there unite themselves. The cycle of their existence is then soon completed, and they perish ere yet the summer has robed the world in beauty.

The judicious writer, whose comments on Spenser's lines I have quoted, says in the same chapter: "A year or two back"—his work was published in 1853—"everybody in London that had a voice was resolved upon being a butterfly born in a bower." When I was a boy the song to which he alludes was still popular, and the melody to which it was sung haunts me still. Copies of it have become scarce. When I was last in England I had great difficulty in finding one. This is how the words run:

"I'd be a butterfly born in a bower
Where roses and lilies and violets meet,
Roving for ever from flower to flower
And kissing all buds that are pretty and sweet,
I'd never languish for wealth or for power,
I'd never sigh to see slaves at my feet,
I'd be a butterfly born in a bower,
And kissing all buds that are pretty and sweet."

"What though you tell me each gay little rover
Shrinks from the blast of the first autumn day,
Surely 'tis better, when summer is over,
To die when all fair things are fading away.
Some in life's winter may toil to discover
Means of procuring a weary delay,
I'd be a butterfly living a rover,
Dying when fair things are fading away."

T. H. Bayley.

Epicurean, is it not? "Let us eat and drink for to-morrow we die." The sentiment is bad, and God, who has fitted all things in just proportions, never gave real ground for false sentiments. As we have seen, the butterfly is not a fit emblem of selfish frivolity. It bears the part in nature that it was destined to bear, and it has to endure its share of ills. Instead of dying when fair things are fading away, many species have to survive the winter, and to perish when fair things are bursting into life, and herein is a truer lesson for those who are aiming at what they are pleased to call a butterfly existence here.

Adelaide Taylor recognized the false sentiment in the song, and in one of those little rhyming lessons on propriety which she and her sisters composed for "infant minds," says,—

"The butterfly, an idle thing,
Nor honey makes, nor yet can sing,
Like to the bee and lark;
Nor does it, like the prudent ant,
Lay up the grain for time of want,
A wise and cautious hoard."

"My youth is but a summer's day,
Then, like the bee and ant, I'll lay
A store of learning by,
And though from flower to flower I rove,
My stock of wisdom I'll improve
Nor be a butterfly."

But in this little lesson we cannot help noticing another very common mistake, that of setting forth the ant as an example of acquisitiveness. Adelaide in the verses quoted suggests the acquisition of learning, but the example is generally taken to suggest the acquisition of wealth. Solomon's words are,—

"Go to the ant, thou sluggard, consider her ways and be wise:
"Which having no guide, overseer, or ruler,
"Provideth her meat in the summer, and gathereth food in the harvest." *Prov.* VI., 6-8.

Now, the lesson conveyed in these words is only that conveyed in "Whatever thy hand

findeth to do, do it with thy might," or in "Be not slothful in business," or in the homely saying, "Make hay while the sun shines." There is nothing in them to countenance the hoarding propensities of the miser.

It has been supposed that Solomon referred to the *Atta barbara* of Palestine, which, like the *Atta malefaciens* of Texas, is said to store up grain However this may be, it is very certain that Adelaide Taylor had an English ant—*Formica rufa*, or one of its congeners—in view. Rev. J. G. Wood says,—

"Ants do not, as has been so frequently said, lay up stores of corn for the winter, for they are in a state of torpidity during the cold months, and require no food. Moreover, an ant would find as much difficulty in eating or digesting a grain of corn as we should in devouring a truss of straw."—Ill. Nat. Hist., p. 426.

Thomas Hood, however, in his "Ode on Autumn," goes to the full length of the mistake and says,—

"The ants have brimm'd their garners with ripe grain."

(2) *Many entomological mistakes of authors are found to be exaggerations of the truth.*

Whatever is strange in other lands becomes a "traveller's wonder." Stories of the admiration it excited in the beholders have afforded food for credulity and speculation. Of mistaken ideas the following Eastern Townships' story affords an instance. Two young Irish immigrants landed at Montreal some years ago. They travelled by the then new line to Waterloo, as far as Farnham. They walked from that place to Cowansville, and arrived at the hotel in the dusk of the evening. After supper they retired to their room. It was a hot July night and they threw open the window for air. In flocked the mosquitoes of course, and began to be very attentive to the new-comers. One of the lads, who was already in bed, called to his fellow, "Pat, put out the light and jump in, and then the omadhouns will not find us." Pat put out the light, but at that moment in sailed a fire-fly. "Och, Terry," he exclaimed, "its not a bit of use, one of the spalpeens *has been and got a lanthern.*"

Saint Pierre, the ingenious author of "Paul and Virginia," learned from Father du Tetre concerning *Pyrophorus noctilucus*, and says of it, in his "Studies of Nature," Vol. II., p. 299.

"There are insects which need no pharos to guide them in their nocturnal perigrinations. They carry their *lanterns* with them ; such are the luminous flies."

Pietro Martire, in the "Decades of the New World," tells us that the lanterns of the fire-flies enable them to see the musquitos on the sleepers' noses, and to pick them off. (He says *faces* ; but the whole includes the parts). His account is as follows: ·

"Hee who understandeth he hath these troublesome guestes (the gnattes) at home, diligently hunteth after the *Cucuij*. Whoso wanteth *Cucuij* goeth out of the house in the first twilight of the night, carrying a burning fire-brande in his hande, and ascendeth the next hillock that the *Cucuij* may see it, and he swingeth the fire-brande about calling Cucuius aloud, and beating the ayre, with often calling out *Cucuie, Cucuie.*" . . . . "The hunter having the hunting *Cucuij* returneth home, and, shutting the doore of the house; letteth the preye goe. The *Cucuij* loosed, swiftly flyeth about the whole house, seeking gnattes under their hanging bedds, *and about the faces of them that sleepe*, which the gnattes used to assayle : they seem to execute the office of watchmen, that such as are shut in may quietly rest. Another pleasant and profitable commodity proceedeth from the *Cucuij*. As many eyes as every *Cucuius* openeth, the hoste enjoyeth the light of so many candels ; so that the inhabitants spinne, sewe, weave and dance by the light of the flying *Cucuij*."

The same writer tells us that the inhabitants travelling at night used to tie a fire-fly to each great toe.

Madam Meriam, the authoress of a History of the insects of Surinam, says that the light of the lantern-fly, *Fulgora lanternaria*, is sufficient to read by.

Now, all these stories are "travellers' wonders," and need to be taken *cum grano salis.* Dr. G. A. Perkins, in the *American Naturalist*, Vol. II., p 462, states that—

"By placing the luminous pads of one insect quite near the paper, very fine print can be easily read by its aid, though I cannot imagine the light, even of a large number, to be sufficient for any practical illuminating purposes, as has been affirmed by some writers."

But Southey, the Laureate, trusted to such particulars, and in "Madoc in Aztlan," Canto XVII., telling of Madoc's deliverance by Coatel, says :

"Fast along the forest way,
And fearfully, he followed to the chasm.
She beckon'd and descended, and drew out
From underneath her vest, a cage, or net,
It rather might be called, so fine the twigs
Which knit it, where, confined, two fire-flies gave
Their lustre. By that light did Madoc first
Behold the features of his lovely guide ;
And through the entrance of the cavern gloom,
He followed in full trust."

"Now have they reach'd
The abrupt descent ; there Coatel held forth
Her living lamp, and turning with a smile,
Sweet as good angels wear when they present
Their mortal charge before the Throne of Heaven.
She show'd where little Hoel slept below."

Robert Pollock, the author of the "History of Peter Wilkins," which is an entirely imaginative and unnatural work, may, perhaps, have read of the occasional phosphorescence of earth-worms. At any rate he makes the lighting up of the houses and streets of Arndrumstake to depend upon the supply of "Sweecoes," creatures which were bred by all the well-to-do persons in the community, for the sake of their light-giving properties. The lamps in which they were confined were globular, "like calabashes." The creatures were changed twice a day, and fed on leaves and grass.

Pollock enters into no minute descriptions of these creatures, and gives no particulars as to the breeding of them. He leaves all such things to the imagination of his readers ; and to it we also must leave them.

(3) Other entomological mistakes of authors have arisen from their launching from the known into the unknown.

It is a dangerous thing to give the fancy scope on subjects with which one is imperfectly acquainted.

Isaac Walton, in "The Complete Angler" (Fourth Day), gives a brief but accurate account of a larva of the Privet Hawk Moth (*Sphinx Ligustri*). The caterpillar died, "but if it had lived," says Walton, "it had doubtless turned to one of those flies that some call flies of prey, which those that walk by the rivers may, in summer, see fasten on smaller flies, and, I think, make them their food."

It is never safe to make guesses in Entomology. Charles Kingsley knew some things about the Dragon-flies ; but he made a *venture*, and—*he made a slip*. The redoubtable Tom of the "Water Babies" came face to face with an "ugly fellow" who informed him that he wanted to "split"

"Why do you want to split?" said Tom.

"Because my brothers and sisters have all split, and turned into beautiful creatures with wings ; and I want to split too. Don't speak to me. I am sure I shall split. I will split !"

A wise resolution, I dare say ; but a little "too previous." However—

"Tom stood still, and watched him, and he swelled himself, and puffed, and stretched himself out stiff. At last, crack, puff, bang ! he opened all down his back, and then up to the top of his head.

"And out of his inside came the most slender, elegant, soft creature, as soft and smooth as Tom ; but very pale and weak, like a little child who has been ill a long time in a dark room. It moved its legs very feebly ; and looked about it half ashamed, like a girl when she goes for the first time into a ball room ; and then it began walking slowly up a green stem to the top of the water.

"Tom was so astonished that he never said a word ; but he stared with all his eyes. And he went up to the top of the water too, and peeped out to see what would happen.

"As the creature sat in the warm sunlight, such a wonderful change came over it. It grew strong and firm ; the most lovely colours began to show on its body—blue and yellow and black spots, bars and rings ; out of its back rose four great wings of bright brown gauze ; and its eyes grew so large that they filled all its head, and shone like ten thousand diamonds.

"Oh, you beautiful creature !" said Tom ; and he was quite glad he had to catch it.

"But the thing whirred up into the air, and hung poised on its wings a moment, and then settled down again by Tom quite fearless.

"No !" it said, "you cannot catch me. I am a dragon fly now, the king of all the flies !"

"*Water Babies*," C.K. III.

The mistake, of course, in all this is, that Kingsley makes the "splitting" to occur under water. Who ever saw, or heard of before, a dragon-fly bursting from its nymphal case below the surface? Why, it would drown! The nymph extracts oxygen from the water by means of a gill-like arrangement within the abdomen; the perfect insect breathes atmospheric air, through spiracles, as other imagos do. It is the nymph, or pupa, that performs the climbing—not the fly.

Wood, in his "Insects at Home," p. 273, says:

"When the pupa has nearly completed its time it ceases to feed, and the respiration seems difficult and labored. An irrepressible instinct then drives it to leave the water in which it has so long lived: and, seizing the stem of a reed or other aquatic plant, it crawls upwards until it is a foot or two above the surface: clasping the reed firmly with its feet, it sways itself backwards and forwards until the pupal skin splits along the shoulders and the wings and body of the perfect insect shows themselves beneath it," etc.

Mr. Spence, in Chapter XXV of "Kirby and Spence's Introduction to Entomology," points out a mistake made by the poet Darwin respecting the nut-curculio. Darwin's lines referred to are:

"So sleeps in silence the Curculio, shut
In the dark chamber of the cavern'd nut;
Erodes with ivory beak the vaulted shell,
And quits on filmy wings its narrow cell."

It is the maggot and not the beetle that quits the nut—its transformation takes place under ground; and the beak of the perfect insect would be better compared to ebony than ivory. In connection with these lines, Spence says:

"The gratification which the entomologist derives from seeing his favorite study adorned with the graces of poetry is seldom unalloyed with pain, arising from the inaccurate knowledge of the subject in the poet."

(4) *Other entomological mistakes of authors seem to have arisen from mere want of consideration of the balance of circumstances.*

Edgar Allen Poe, in one of his highly sensational tales, tells of "a gold bug." This bug, he informs us, was a scarabæus; but we are not to conclude that it was a right down honest "tumble-bug." The term scarabæus was formerly used for beetles generally. It may have been a sort of *Cotalpa*; but it had some peculiar qualities; ponderosity was one—it was so heavy that it was used as a plumb; but notwithstanding its great weight, it was very active—it flew on before. Then too its pugnacity was remarkably—it bit its captor's hand; and it was not without suspicion of exercising poisonous qualities like the centipede and the tarantula. *I need hardly say that the species has become extinct.*

I have no doubt that many other instances, such as I have adduced, of the entomological mistakes of authors could be found; but these will suffice for the presnt occasion. There is a satisfaction in turning the laugh against men of letters; for some of them have shown a disposition to under-estimate those benevolent, amiable and altogether-worthy gentlemen, who have been good enough to pursue the study of entomology for the benefit of mankind.

For example: Does Fennimore Cooper wish to portray an entomologist? He does so in Dr. Obed Batt; and the crowning scene in which this personage is presented is that in which he is brought forward by the Indians seated upon the *Vespertilio Horribilis Americanus* with his butterflies and other "specimens" disposed about his person—converting him into a sort of perambulating museum.

And yet Fennimore Cooper was considered a decent sort of man! I am told he was a church warden!!

But what shall we say of that horrible fellow Barham, the author of the Ingoldsby Legends, and of the fate that he awarded to an amiable scientific gentleman?

You have read, I dare say, of Vidius Pollio, who, in the days of one of the Cæsars, was accustomed to throw his aged and worn-out slaves into his fish-ponds to fatten his lampreys for the market. To such a fate does Barham devote an entomologist, "Sir Thomas." This good man, while searching for nymphæ, tumbles into the water and is

drowned. After a length of time (during which his widow is consoled by the attentions of one Captain McBride) he is fished out in a dilapidated condition; and, from the pockets and other recesses of his clothing, a number of fat eels are taken. Some of these are cooked for the lady's supper. And this is what she says of them:

"Eels a many I've ate; but any
So good ne'er tasted before!
They're a fish, too, of which I'm remarkably fond:
So pop St Thomas again in the pond—
Poor dear! *He'll come to no more.*"

The man, who could imagine such a termination to a useful and honorable career, ought to have been one of the crew of the "Nancy Brig," but *not* the "long and weedy" survivor!

THE SEASON OF 1893.

By Rev. Thomas W. Fyles, F.L.S., South Quebec.

The season of 1893, though it opened somewhat later than usual, has been a favorable one for entomologists. Diurnals in the early part of it were particularly abundant.

My first capture of any kind was made on the 13th of April, when I captured a fine specimen of *Ursus satyricus* Gr., in a window of the church at Rawdon, P. Que.

After this came a cold spell: and *Chionobas Jutta*, Hub., which usually appears on the 1st of June, did not show itself till the 3rd. On this date I saw three specimens. On the 7th Mr. H. H. Lyman and I found it in perfection and in fair numbers. The improved drainage of the sourrounding properties is affecting the swamp at Bergerville in which this species is taken—it is not nearly so wet as it was in former years.

The first specimens of *Neonympha Eurytris*, Fabr. (Fig. 18) that—as far as my knowledge extends—have been captured in the vicinity of Quebec, were taken at St. David's by Mr. Hanham on July 1st. This species is not uncommon at Montreal.

Fig. 18.

Debis Portlandia, Fabr., appeared in this neighborhood in the 1st week of July and continued through the month. I have seen worn specimens of the species as late as the 2nd week of August.

Satyrus Nephele, Kirby, first showed itself on July 18th, and very dilapidated specimens of it were to be seen as late as August 31st.

Papilio Turnus, Linn. (Fig. 19) was remarkably plentiful early in the season. I had wondered in former years that it should be abundant at Quebec, seeing that so few apple trees grow in the vicinity. The mystery was solved when I found the larvæ feeding on *Amelanchier Canadensis* which is abundant here.

Edemasia concinnata, A. & S. (Fig. 20) which in the Eastern Townships feeds upon the apple, feeds upon the bramble at Quebec. The larvæ in their early stages lie clustered on the under side of the leaves, and thus escape notice. I found a batch of them on Aug. 5th and took them to my home, where I fed them alternately on bramble and apple. They fed with avidity upon both and throve equally upon them. They attained their growth (Fig. 21) and went into cocoon among dead leaves on the surface of the earth.

Another apple tree feeder that has to change its diet at Quebec is *Platysamia Cecropia*, Linn. It feeds on the soft maple (*Acer rubrum*) and also, I am inclined to think, on the alder. Last autumn I found two cocoons (Fig. 22) of the species in the midst of an alder swamp, far from tree or shrub of any other sort.

In the Society's 23rd Report I recorded my first captures, on the Heights of Levis, of *Colias interior*, Scud. They were made in the month of September. This year I watched carefully for the appearance of a summer brood. It came in July. I took one or two specimens at St. David's on the 1st of the month, and on the 5th the insect was out in increased numbers. It was gone by the end of the month. As I have said the autumn brood of Interior appears in September.

Fig. 19.

Fig 20.

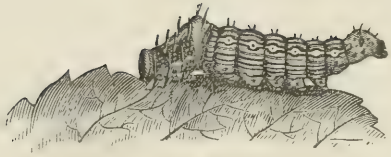

Fig. 21.

Fig. 23.

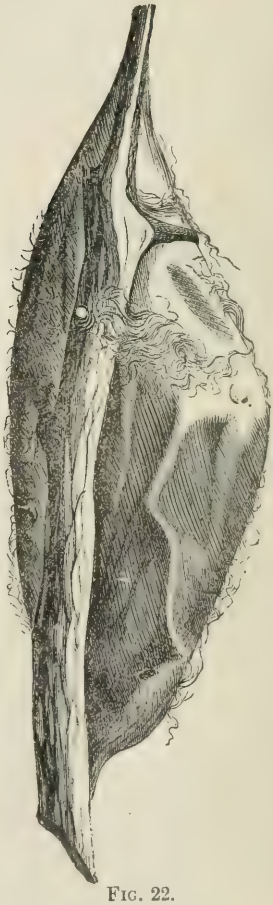

Fig. 22.

In the last week of July a second brood of *Colias Philodice*, Godt. (Fig 23.) appeared. It was out in abundance by the 1st of August. On the 31st of that month worn females were still to be seen laying their eggs on *Vicia cracca*. On the 2nd of October I captured fresh specimens of a third brood of Philodice; and on the 22nd of that month this species was still plentiful, flitting about the flower-heads of Taraxacum.

Argynnis Cybele, Fabr, *Argynnis Aphrodite*, Fabr., and *Argynnis Atlantis* appear in July. On the 6th of the month they were all on the wing together. I found a full-grown larva of the first named on June 18th. It went into chrysalis on the 20th, and the imago appeared on July 9th. For the escape of this the pupa case was ruptured *on the under side*—the upper remaining intact On the 31st of August very worn specimens of Atlantis were still on the wing.

Melitæa Harrisii, Scud., was plentiful at Levis, this year at the end of June. It continued till the 2nd week in July. A few years ago I took this species at St. Henri, 9 miles south from Levis. It frequents spots in which its food-plant, *Diplopappus umbellatus*, is abundant.

Limenitis Arthemis, Drury, was rather plentiful from the 1st of July till the middle of the month.

Two of the prizes of the season were taken by Mr. Hanham on the Island of Orleans, viz:

Anisota senatoria, Guen, and *Plusia thyatiroides*, Guen. Thanks to the generosity of Mr. Hanham the former is now in my collection I have only heard of one previous capture of this insect in the Province of Quebec. It was made some years ago by the late Mr. Bowles.

Other captures worth recording were *Feniseca Tarquinius*, Fabr., Aug. 14th, Isle of Orleans. *Grapta gracilis*, Gr. & R, July 17th, Levis. *Vanessa Milberti*, Godt., July 3rd, Isle of Orleans. *Pyrameis Huntera*, Drury, Aug. 5th, Isle of Orleans. *Hemaris tenuis*, Gr., Aug. 5th, Isle of Orleans.

The season has been a fine one for the "Skippers." The order in which the different kinds of these appeared at Quebec was as follows:

The first to show itself was *Pamphila Zabulon*, Bd.—Lec. It came early in June. While it was still out *Pamphila Taumus* appeared in crowds dodging about the meadows like children "playing tag."

Pamphila Mystic, Edw., presented itself on the 1st of July and continued till the 20th. On the former date Mr. Hanham took a worn specimen of *Carterocephalus Mandan*, Edw., at St. David's, on the south side of the St. Lawrence; and on the 9th of the same month he captured at the same place a specimen of *Achlyodes Samoset*, Scud. Both Mandan and Samoset are very rare at Quebec, two or three specimens only of each kind having, to my knowledge, been taken. On the 11th of July *Pamphila Wamsutta*, Harr., and *Pamphila Metacomet*, Harr., showed themselves. At this date Taumus was still plentiful.

Pamphila Manitoba, Scudder, appeared on the 5th of August and continued till the 25th. It was plentiful on the Island of Orleans and on the Heights of Levis (see 23rd Rep, p. 31) frequenting the flower heads of Solidago and Gnaphalium. On the 10th of the month and again on the 13th I obtained eggs of the species. They were laid dispersedly on blades of grass, etc. Their size (nearly one-twentieth of an inch in diameter at the base) was large in comparison with that of the mother insect Their shape was that of a gum drop – flat at the bottom and rounded above. They were white like frosting and in some lights seemed to be irrorated with red, blue and green. *They have not yet hatched.*

An insect which has been very abundant in this locality this season is *Depressaria Heracleana*, De Geer. The species was well and fully described by Dr Bethune in the *Canadian Entomologist*, vol. II, page 1. In this district it feeds in the umbels of the Cow Parsnip, *Heracleum lanatum*, and, when full fed, bites its way into the hollow stems of the plant and spins its cocoons in their recesses. The moths come out in the Fall and hibernate.

The Wild Hazel, *Corylus Americanus*, has this year been much infested with the larvæ of a species of Lithocolletis—probably *L. Coryliella*, Chambers. These creatures form circular blisters, about the size of dimes, in the leaves of the plant. In appearance they somewhat resemble the larvæ of *L. hamadryadella* as shown in an article by Prof. Saunders, in the Report of the Fruit-Growers' Association of Ontario for 1882, p. 277. They are about three-tenths of an inch in length, much flattened and having the segments very distinctly marked. In colour they vary from sage-green to amber. The head is small and flat. From the 3rd to the 11th segments inclusive, there are, on the under side, remarkable elongated, brown markings; and on either side of each segment, from the 6th to the 11th inclusive, there is a round, brown spot. The feet are white and are merely warty projections. Along the sides are a few slight bristles. The larvæ have not yet gone into chrysalis but have become more plump and of a lighter tint of amber.

Perhaps the most note-worthy occurrence of the year, from an entomological point of view, has been the amazing numbers of the larvæ of *Catastega aceriella*, Clemens. From Montreal to Quebec and southward to the border they have appeared in myriads. Every maple-leaf seemed to have its tenant.

The operations of the Catastega larva are very remarkable. Working on the under side it gathers around itself a considerable portion of the leaf, securing the lines of contact of the gathered part with a web. Then it bites away portions of the inner skin of the leaf and proceeds to make itself a case; and, as it grows, it enlarges this till it is about an inch and a half long and in shape something like that of a cornucopia. Into this it can completely retire. The larva when full grown is about half-an-inch long, cylindrical, pale green, with an amber-colored head. It attains its growth about the time that the leaves begin to fall. It then vacates its case and spins a slight cocoon between the leaves or in the folds of a leaf. The pupa is about one-fourth of an inch long, pale yellowish brown in colour, having rather large wing cases and tapering abdominally to a point.

The insect was named by Clemens who mentions it in the Proceedings of the Ent. Soc. of Phil., vol. I (1861), p. 87. He seems to have been acquainted with the case only. There is a reference to the insect in Packard's Forest Insects, p. 409. We shall probably know more about the insect next spring when the imagos begin to appear.

In the meantime, the way to check the increase of the species is obviously to rake up the dead maple-leaves into small piles, and—under favorable circumstances—to burn them.

On August the 23rd, a curious phenomenon was witnessed in Quebec. All the streets of Lower Town were occupied with clouds of winged ants, of the species *Formica flava*, Fabr. The carters had the utmost difficulty in controlling their horses; and the foot-passengers shrouded their faces as they walked along. I read in the papers at the time that a similar plague had appeared in one or two places in the Maritime Provinces.

The Lombardy Poplars in these parts were, this season, affected by a species Pemphigus. The insect produced galls on the leaf-stalks, resembling in size and shape the nut-galls of commerce, and having on one side a slit about three-sixteenths of an inch long. I opened one of the galls on the 6th of July, and found it to be full of insects of the kind, some winged and some wingless. After the galls had withered, I found numbers of apparently the same species of insect, in the wingless state, infesting the young willows near by. The creatures lay thick on the under sides of the twigs sucking the plant-juices.

My last captures this year were made on the 4th of October, when I took *Therina fervidaria*, Hubn, and *Epirrita dilutata*, Bork,* as they were resting on the trunks of trees at Spruce Cliff, Levis. On the same day I saw a fresh female of *Orgyia antiqua*, Linn, laying her eggs on a young spruce.

E. dilutata was taken at London, Ontario, about the same time, by Mr. J. Alston Moffatt.

T.W.F.

MOSQUITOES.

By J. Alston Moffat, London, Ont.

The mosquitoes belongs to the order "Diptera" or two winged flies, which includes all insects of whatever size, form or color, which have but two wings, making them easily separable from the Hymenoptera, to which the bees and wasps belong, which are possessed of four wings.

Again, the mosquitoes belong in that order to the family Culicidae which are characterized by long and slender mouth parts, long legs and antennæ, of which there are many genera, and the genus to which the mosquito belongs is called Culex, which is recognizable from the other genera of the family by its biting propensity, whilst the distinguishing, or specific name of our common form, is Pipiens of Linnæus; a name suggested by the constant piping produced during its flight by the rapid stroke of its narrow wings which are said to vibrate three thousand times a minute. (Fig. 24) represents a mosquito, and (Fig. 25) its mouth-parts highly magnified.

A large number of species have been described and named by different authors—50 are given to Amercia, 35 to Europe and 100 to the rest of the world.

Mr. F. W. Urich, in a paper read before the Trinidad Field Naturalist's Club, says: "So far as Trinidad is concerned I may say I have observed at least ten different kinds of mosquitoes, varying in size and color, and the bite of some of them is far from being pleasant." But as in other departments of natural history, species have been created upon very slight differences, the probability is that many of those so-called "species" are

Fig. 24.

Fig. 25.

but local variations of one species. Yet certain it is, very considerable difference in size is to be observed in the same locality, but as all creatures are given to vary in size, the same liberty may be allowed to Culex pipiens. Whether the bite of the large ones is severer than that of the small ones, does not seem to have been specially observed, but personal experience corroborates the statement that all bites are not equally sharp.

The name Mosquito is a Spanish term, signifying "little fly," and would probably be applied to any biting winged insect, regardless of structure, by the Spaniards who first landed on the continent. And those of them that returned to their own country would relate stories of suffering they had to encounter and endure from their tiny foes; which were of more than Aztec ferocity and tenacity. Even yet extraordinary tales are told of the size and savage nature of the mosquitoes of some localities over those of others. The fame of the New Jersey breed and the Mississippi gallinipper has gone far abroad, but I suspect that the principle cause of suffering in one locality over another is to be attributed to numbers, rather than to any difference in the size of the insects. Travellers have recorded their experience with mosquitoes in all parts of the world; some declaring that those of the Artic regions are the worst they ever encountered, but South America, from its climatic conditions, and its low lying lands, which are frequently flooded, is in a position to carry off the prize against the world for its crop of mosquitoes, and that the early travellers there were duly impressed with this fact is evidenced by the names given to

places such as the Mosquito Coast, Mosquito Bay and Mosquito Town. In ancient history we read of armies on the march being arrested on the way and made to beat a hasty retreat from the attack of these tiny warriors, which is quite believeable; for if we take into consideration the scant and loose covering which they probably wore, which gave the wearers so much more space to defend, they were not in a condition to pursue human foes when every man of them was engaged in a double-handed conflict with such pertinacious insect enemies.

There is a prevalent opinion in Europe that mosquitoes are an exclusively American production, and in England especially it is the general belief. We often see it in print and hear it confidently asserted that there are no mosquitoes in England. The usual expression is "We have gnats but no mosquitoes," whilst the fact is, the English Gnat and the American Mosquito cannot be separated generically and probably not even specifically. The two names being but local synonyms for the same insect. But even scientific authorities have assisted in perpetuating the misunderstanding. Newman in his "Familiar introduction to the history of insects," has a paragraph headed "Mosquitoes or Simulites," in which he refers to a wood-cut of a Simulia, which strongly resembles that terrible pest to the early settlers of the country, the "Black Fly," *Simulium molestum*, whilst he gives Gnat as the common name for the genus *Culex*.

The settlers of this country adopted the common name Mosquito for *Culex pipiens*, and used the name Gnat to designate an insect that was more felt than seen. So microscopic was it, that the excessive irritation produced by its attack on exposed parts was often the first intimation of its presence; yet so abundant were they at times, that small clouds of them were distinctly visible from their density. They were active only in the evening, or in densely shaded woods. This pest seems to have entirely disappeared with the clearing up of the country.

Many people call all mosquito-like insects by that name, or, if in Europe, they would call them gnats, and include under these names, the families *Tipulidae* and *Ephemeridae*, which are quite innocent of all biting propensity. So that when these names are used and alarming reports circulated as to their abundance, it is impossible to be quite sure what insect may be meant. It is recorded that in 1736, gnats were so numerous in England, that vast columns of them rose in the air from the spire of Salisbury Cathederal, like smoke, which made the people think it was on fire. Mention is made of a column, pyramidal in form, over a tree, 50 or 60 feet in height (?)—whilst, at a more recent date, another column is mentioned as being seen in a garden 3 feet in diameter and 20 feet high. We may justly conclude that these columns were not composed of *Culex pipiens*. And when we are informed that "every part of these columns was in the liveliest motion," we may at once infer that they were composed of some of the *Ephemeridae*, which Wordsworth alludes to, as

> "The gilded summer flies,
> That mix and weave their sports together in the solar beam."

And when we are told that "their bite was so envenomed that it was attended with violent and alarming inflammation," we may safely say, that these bites did not belong to those columns, but to the genus culex, whose habits are quite different. Who ever saw *Culex pipiens* in a playful mood? She is ever intensely absorbed in business, even her song seems to indicate that her thoughts are bent in that direction; at least it turns ours very quickly to her business methods.

Whilst on the subject of these dancing columns, I will give an illustration of their remarkable powers of sustained flight, which came under my own observation. I was returning from an excursion by rail, on a fine summer evening, and to have an opportunity of enjoying it to the utmost, I took my seat on an open car which had been fitted up to provide extra accommodation. The car in front of me was high roofed, and over a rear corner of it had gathered one of these clusters, high and dense, which was vigorously besporting itself in the rays of the setting sun. I thought to myself "when we go, you will get left," but I was mistaken. When the train started it went with it, and the cluster maintained its position with as much apparent ease as when the car was at rest. Did

each individual of that cluster keep its eye on the car, so as not to fall behind! But it could not accommodate its movements to suit the lateral swaying of the car: every now and again it found itself a little more off or on the corner. It maintained its position until darkness obscured or dispersed the dancers.

Culex pipiens, like many of its relations, lives the earlier part of its life in the water. The female mosquito when ready to deposit her eggs, seeks for stagnant water as the most suitable place on which to do so. The Rev. J. G. Wood thus clearly describes the opperation: "Placing her front legs on a piece of floating stick, straw, or anything that will support her tiny weight, she allows the middle pair of legs to rest on the surface of the water, and crosses the hind pair so as to look like the capital letter X. She then deposits a rather long and spindle-shaped egg, and places it upright with the base downward in the angle of the X. Another egg is quickly placed by the side of the first, and followed by others, all of which are glued together by a cement which is not affected by water. Guided by the crossed legs, the eggs are formed into a boat-like shape, and are left to float on the surface of the water."

These boat-like masses are often longer than wide, the lower end of the eggs being the largest, where the head of the future larva is to be, gives more surface below than above, which naturally turns the ends upwards and helps to give them the boat-like form. In a few days time, according to the weather, the eggs mature and the tiny larva is ushered into what is for the time its native element. In this state it is a particularly interesting creature, large in head, slender in body with two openings at the tail; one situated a little to one side, and surrounded with fine hairs, opens into the breathing tubes, the other being the end of the digestive canal. It is very active, propelling itself through the water with a peculiar jerking and wriggling movement, which has procured for it the appellative "wriggler," going to the bottom to feed, then rising to the surface to breathe. It may at times be seen resting with its breathing tube above the surface, head down and its mouth-parts moving as if it was taking nourishment. Having changed its skin several times, and eaten all it wants, it prepares for another change of form, and throwing aside its larval covering, it emerges a pupa. Its form is greatly altered, much larger at the head end where the mouth-parts, wings and legs of the future mosquito are bunched together in a rudimentary state, the abdomen slender with two propeller-like blades at the end to assist its movements, for it is still active, but more singular still for a pupa, it breathes now not through a tube at the tail as fomerly, but through two projections which it has been provided with, which are situated on the top of the thorax, so that when it rises to the surface of the water to breathe, it holds its head up now. A wonderful change of habit in so short a time; whilst living in this state, it also enlarges but does not feed. Having thoroughly matured it is now ready to change its aquatic life for an aerial one. The pupa comes to the surface of the water, the thorax rising above it, the hinder part straightens out, and almost immediately the pupa case bursts on the top of the thorax, and the head of the mosquito appears in the opening by a contracting and expanding of the abdomenal segments, the head and thorax are pushed forward and out sufficiently far to free its legs, when it feels for a support which may be the pupa case which now floats on the water as a boat. The wings now expand, the abdomen is withdrawn from the case, and *Culex pipiens* is off on other business. The whole time required for this last transformation is a minute or less. The length of its preparatory life is variously estimated, the weather having a powerful influence—a month is considered quite sufficient. Three or four days to mature the eggs, fourteen or eighteen for the larval stage, and five to seven for the pupal. But Prof. Riley, says: "Their delevopment is rapid and with one species at least it has been ascertained that the entire life round from egg to adult is undergone in less than two weeks."

As soon as they have got their wings they make for the thickest vegetable shade within reach. It is said that they will fly for miles inland, but never fly far over water. We read of travellers on the South American rivers, that they prefer to pass the night in their small boats anchored out on the river, rather than attempt to sleep on shore; willing to run the risk of being devoured by alligators in order to escape the certainty of it by mosquitoes.

Culex pipiens is a frail and delicate creature to be possessed of such a vicious and blood-thirsty disposition. But here it must be stated that the sexes differ in this respect. It is the female only that bites; she alone is responsible for all the evil reputation which has been attached to the species; the male has not the power, even if he had the will, whilst her will and power seem to be commensurate.

The mouth parts of the female constitute a wondrously elaborate and complex apparatus, which no verbal description can do justice to. What appears to the naked eye to be a single sting, is composed of no less than seven distinct and separable parts. What is taken for the sting is only the sheath in which the sting rests when not in use. Two of the parts are barbed at the point for cutting the skin. All but the sheath enter two-thirds their full length before they begin drawing the blood, the sheath doubling up under the body of the insect.

The manner in which the mosquito draws up the blood to satisfy its cravings, is probably similar to that by which a butterfly secures the nectar from the flowers. Let us consider the long proboscis as lips, the mouth proper being situated in the head at their base; when the lips have entered the fluid the muscles around the mouth are contracted; that produces a cavity which is necessarily a vacuum, the fluid naturally rushes in to fill it. When it is filled the muscles around the mouth relax, a valve at the base of the lips closes and prevents its return, and the fluid is forced down the gullet.

The rapidity with which the mosquito thus pumps up the blood, and the quantity it secures in a given time, may easily be observed by any one curious to know, by allowing one of them to operate on the back of the hand, and watch the filling up of the abdomen. I once clipped the end off the abdomen of one thus situated without disturbing its operation, and it pumped away until a pool of blood that had run through it formed on the back of my hand and began to run off, when I stopped the performance. I had been informed that this could be done before I succeeded in doing it.

No poison gland has yet been found in the mosquito, but the irritation resulting, and often continuing long after the bite is given, has led to the general conviction that poison must be conveyed with it. One writer relates that a drop of clear fluid has been observed at the end of the trunk, whilst Reamur says he saw fluid in the trunk itself. Some contend that this fluid is used for diluting the blood so as to enable it to pass through the extremely fine tube, but the quantity that they produce is so small, as compared with the amount of blood they take, that it could have but little effect in that way; unless it was endowed with some powerful chemical property. Some have stated that if they are allowed to take all they want, there will be no after irritation, the poison being all removed with the blood taken. But personal experiments in this direction do not confirm the statement.

There is a great diversity in the effect of the mosquito bite on different persons, just as there is in the sting of a bee; not from any difference in the sting and bite, but from something in the constitution of the individual. The Rev. J. G. Wood tells us of the effect of a single gnat bite on himself, given at the junction of the thumb with the wrist. (It is *culex pipiens* he is speaking of). He says: "The hand swelled up until it looked like a boxing glove, was purple in color where it was not crimson, and it was more than three weeks after the bite was inflicted before I fully recovered the use of my hand." This may be considered a serious case, and if he had received several bites at the same time, some of them about the face, we shall say, there is no saying how much more serious it might have been. I copy the following from a communication by H. Stewart, of North Carolina, dated Nov. 3, 1891, given in *Insect Life*, Vol. 4, p. 277, as illustrative of this point:

"I was interested in reading a recent number of *Insect Life* to the effect that the poison of the mosquito was provocative of insanity. When I was engaged in exploring in the vicinity of the north shore of Lake Superior about twenty-five years ago, I had more than one proof of this fact. One of my men was badly bitten, and seemed to suffer more than any others of the company. He became violently insane and ran off in the woods, and in spite of efforts he eluded pursuit and was never found again. Another man on a different occasion was affected in a similar manner, and was captured with difficulty, after a long chase, in which he exhibited the utmost terror, but after a few days' close confinement in the camp he regained his reason. Afterwards he was so seriously

affected by the poison that he had to be sent home. I have noticed that the poison affected persons differently, causing severe swelling in some, fever in others, pains in the limbs in others, while some were but slightly annoyed. I was myself very little troubled by these pests" Along with that we may place the report given by a German professor, of a Mexican doctor who was attending a lady suffering from inflammation of the brain. She had been unconscious for twelve hours, and gave signs of approaching dissolution. The doctor removed the mosquito net and opened the windows, giving the mosquitoes free access to his patient for two hours, when consciousness returned and the lady given up for lost started on the way to recovery, which is quite a likely thing, as blood-letting would be an excellent method for relieving the congested parts.

We frequently read in the newspapers of people suffering from alarming sores, the result of "a mosquito bite," some of them ending fatally. Thoughtless persons, or those ignorant of the nature of mosquito bites, will persist in rubbing the bitten parts, which only tends to increase the irritation and calls for more rubbing. This, continued, may break the skin, blood-poisoning may then ensue, and, if combined with an unhealthy condition of the system, death may quite likely be the result. I have seen children whose bodies were covered with sores caused by their scratching the mosquito bites.

To those who have not lived in a mosquito infested district, and have formed their opinions by reading such reports: it might seem to them that life in such a place would be constant misery, and would expect to find the inhabitants covered with sores and bandages; but such is not the case. There is unquestionably a kind of inoculation that takes place in those much exposed to the attack, which gives them immunity from any inconvenience after the bite is given. The writer of the article "Mosquito," in the *Encyclopædia Britannica*, says: "Even in Britain the annoyances caused by the gnats—"*culex pipiens*"—is very great, and in marshy districts often unendurable, especially to new comers, for it seems probable that the insects really attack a visitor more furiously than they do the natives of the district, but, on the other hand, the latter may be more indifferent to their assaults." Now, we cannot suppose that the mosquitoes prefer a stranger to a native, or that the native does not feel the bite. It is the consequences that make the difference; the visitor dreads these, the native does not, as there are none to him, he having been thoroughly inoculated; the bites may be felt equally by both, although there are some endowed with a greater amount of pachydermatous insensibility than others It is undoubtedly new-comers to an affected district that suffer the worst, that is, if they have not previously been subjected to the attack. Usually a bite on such a one raises a spot about the diameter of half a pea, hard and whiter than the rest of the skin, with a distinct red dot in the centre, producing an immense desire to rub the spot, which, if indulged, causes various degrees of inflammation and redness, with an increased inclination to rub, lasting for two or three hours with some, but twenty-four or more with others. This sort of thing may have to be endured for the whole of the first summer After that the bite may be felt just as sharp as before, but no such after discomfort will follow. Hence the apparent indifference of the native, but sufficient numbers would make even him quail before their assault, but, being once clear of them, no further inconvenience is felt by him. This kind of inoculation is vividly illustrated in the case of children going into an infested locality to live; for the first season every bite leaves its mark conspicuous, but afterwards bites show no more than if they had not been given.

How long the mosquito lives in the mature state, is not known with any degree of certainty. Dr. C. V. Riley says: "So far as we know, our northern mosquitoes pass the winter in the imago state, but in limited numbers" Supposing these hibernators are the parents of the summer crop, they might in this latitude begin depositing their eggs—of which they lay about 300—in the beginning of May and allowing a month between egg and imago, we see that by midsummer the number, under favorable circumstances, would be great. But the question to settle is, how long does the female live in summer before depositing her eggs? for we cannot suppose that, contrary to the nature of other insects she lives long afterwards; unless she does not lay them all at once When one visits a piece of woods situated a long way from stagnant water every few days, and finds an un-

limited supply kept up for weeks, or even months together, it does not seem to favor an early demise. Another interesting question in this connection is, are these hibernating females fertilized before winter sets in, or do the males live over also?

It is the prevailing opinion that mosquitoes live exclusively on animal blood, and yet, probably, not one in a million of them ever gets a taste of it. It is not reasonable to suppose that the life, even of the mosquito, can be sustained long without food of some sort. Several reports have been made from time to time of a vegetable-feeding species of mosquito having been seen. Is it a separate species, or is it our old acquaintance *Culex pipiens* indulging in a little of her natural vegetable diet? I once saw a mosquito on the smooth bark of an aspen poplar, seemingly engaged in an effort to extract something out of it, but with very limited success, so far as the appearance of the abdomen indicated, yet it went through all the movements required to make the success complete. If they will attack the hard bark of a tree, how much more likely is it that they would try the soft stems of succulent plants. When we understand that this is one of the habits of the insect, we see that there is a double reason present why they should seek the cover of rank vegetation, one protection from the direct rays of the sun, which they cannot endure; the other, that they may obtain food to sustain life, Yet, no matter what amount of vegetable juice they may take, it never slacks their thirst for blood. This the unfortunate collector well knows to his cost, when he has been allured in the pursuit of some attractive specimens, to the stirring up of a tall and luxuriant clump of weeds in a damp and shady place.

Many remedies have been suggested for relieving the irritation produced by mosquito bites. The Rev. Mr. Wood says arnica saved him from a vast amount of torture. A wash of ammonia is said by others to give immediate relief.

To rid the house of their presence in the evening, so as to get peaceful rest at night, all are familiar either by observation or report, with the use of smoke. Indeed, the primitive "Smudge" was the only method available in new settlements; but now we have a more clean, convenient and efficacious material to use for the same purpose in insect-powder, 'pyrethrum." Make a little pyramid of the powder about an inch an a half in diameter at the base, on some incombustible material, and ignite it at the top. It will consume slowly, producing smoke enough to fill a large room, which will kill or stupify every mosquito in it.

I copy the following from *Insect Life*, Vol. V., p. 359: "The *Indian Medical Journal* for March 16th says that a Bombay newspaper calls attention to the virtues of the castor oil plant as a means of protection against mosquitoes. In Egypt it is planted about houses to drive the insects away. In towns a better plan is to have the growing plants in pots, and bring them into the house for a day or two at a time, but they must not be kept too long in the shade, for *Palma Christi* is a sun-loving plant. A writer is cited as saying that the mosquitoes are killed by a poison they find on the lower side of the leaf, but it is stated that if a dozen leaves are placed about a room that swarms with mosquitoes they will disappear without leaving any dead ones lying about." But vigorous efforts should be made in all mosquito-infested localities to reduce as much as possible the opportunity for their breeding. Stagnant water is well-known to be the principle source whence comes the mosquito plague. This, then, should be got rid of as soon as possible. When this cannot be done at once it should be treated with a little coal oil, which will put an effectual stop to their propagation as has been demonstrated by Mr. L. O. Howard's experiment, published in the last Annual Report of the Society, and thus an immense amount of suffering will be saved to man and beast.

CANADIAN UROCERIDÆ

(Abstract of a Paper presented to the Royal Society of Canada.)

By W. Hague Harrington, Ottawa.

The paper which I have the honour to submit is, from its length and the number of descriptions contained in it, not suitable to be read in full. I have, therefore, made a short abstract from its contents, to indicate its scope and purposes. It treats of the Urocerida, a family of the order Hymenoptera; the species of which are lignivorous in the larval state and attack our forest, shade and fruit trees.

In discussing these insects I have accepted the name Urocerida in accordance with the classification of North American Hymenoptera published by Mr. E. T. Cresson, who for many years has been a diligent student of the order, and who has described a large proportion of the American species. In agreement with European nomenclature, the name Siricida would be used, as the first species described were placed by Linnæus in Sirex, one of the ten genera into which he divided all the Hymenoptera. His simple classification has been so expanded, to receive the vast number of insects since described, that the Hymenoptera of America, north of Mexico, are separated into about a thousand genera.

The genera placed by Cresson in the family Urocerida have been the subject of much discussion by systematic entomologists and their relations to one another and to the Tenthredinidæ, have been variously viewed. The object of this paper is not however, to discuss the systematic position of the genera, but to bring together for the benefit of students of the Canadian fauna, the descriptions of the various species, and to add such information regarding them as my observations have furnished. No new species are described, but I have rather endeavored to show where the present number of species could be lessened, and the suppressed be placed as varieties. The insects of this family vary very much in size and sometimes in coloration, and several of the species being widely distributed and rare, have been redescribed from different regions.

There are five genera: Ceplus, Xiphydria, Urocerus, Tremex and Oryssus. To facilitate the identification of specimens, I have prepared synoptic tables based upon such features as seem most distinctive. The individuals of Cephus appear to be very rare in Canada, but six species are represented, including *C. pygmæus*, Linn., which has been introduced from Europe, where it is well known, and at times a destructive borer in the stems of wheat. In Xiphydria several species have been described, but some are only varieties. The most common species is *X. albicornis*, Harris, which is frequently found on maples, and which does considerable injury to shade trees. I have given observations upon its habits, in the publications of the Entomological Society of Ontario.

The typical genus Urocerus (Sirex) contains about twenty American species of which nearly all occur in Canada. Some of these are large, handsome insects, widely distributed throughout the Dominion, from Nova Scotia to Vancouver Island and very far northward. The larvæ of these insects are borers in our coniferous trees and their distribution is probably coextensive with the trees they infest. In some sections, pine, spruce, fir, etc., suffer considerably from their attacks. The three most common species are *U. albicornis*, black, with white banded legs and antennæ; *U. flavicornis*, black, with yellow bands and antennæ, and *U. cyaneus*, blue, with ferruginous legs.

Tremex contains only one species, the well-known *T. columba*, the larvæ of which are popularly known as Horn-tails, a name also applied sometimes to the adult insects on account of their long ovipositors. This insect attacks chiefly the maple and beech, which are often thoroughly riddled by its larvæ, but it also infests other forest trees, such as oak and sycamore, and fruit trees, as apple and pear. It is a striking insect in appearance, one of the largest of our Hymenoptera, richly marked with black and yellow, and provided with a long, stout ovipositor for penetrating the thick bark of the trees in which it deposits its eggs.

The genus Oryssus differs in many important characters from the preceding, and the insects have a very different appearance. They are short and cylindrical in form ; black, or with the abdomen partially red ; have the antennæ short and geniculated, and in their movements they are extremely alert and active. Four species have been on the American lists, but observations which I have made on these insects for several years have convinced me that they all belong to one species. The larvæ live in maples (and possibly in other trees) but it is not known whether they live upon the substance of the tree, or are parasitic upon other wood-boring insects.

For a satisfactory knowledge of the habits of our Uroceridæ, it will be necessary for our entomologists to devote much close attention to the several species. Unfortunately the order Hymenoptera has not at present many students, although both from the scientific and economic standpoints there are many reasons why it should be thoroughly investigated. The late Abbé Provancher, whose scientific labors, especially in Entomology, gained for him a membership, which, unhappily he did not long live to enjoy, in your honorable Society, was a zealous worker in this Order, and he described very many of the Canadian species. His death was a great loss to the study of Entomology in Canada, but it is to be hoped that his collections, which contain the types of so many species, may be placed where they will be carefully preserved and accessible to future investigators.

ADDITIONAL NOTES ON JAPANESE INSECTS.

By W. Hague Harrington, Ottawa.

On my return in November, 1891, from a visit to Japan, I prepared for the annual meeting, held a few days later, a hasty outline of my impressions of the insect fauna of that country. My captures have since been mounted and arranged, and the number of genera and species ascertained, although time has not yet been found to determine the names of the insects. My stay in Japan lasted only ten weeks, and this time was largely occupied in travelling and sightseeing, so that I had few opportunities for systematic collecting, and many of my most interesting specimens were accidental captures. The wealth of the insect fauna is evident, from the fact that under such conditions, and after the most prolific season had passed, six hundred species were taken, Coleoptera constituting one-half, Hymenoptera one-fourth, and miscellaneous insects the remaining fourth. The majority of the specimens were obtained in the vicinity of Yokohama, Hakone and Nikko, which are all situated in the central portion of the Empire. Adding to my own captures some Coleoptera received from my brothers residing in Yokohama, I find my little collection to be composed as follows :

Coleoptera	350	Species.
Hymenoptera	160	"
Hemiptera	75	"
Diptera	30	"
Orthoptera	20	"
Lepidoptera	10	"
Neuroptera	10	"
Total	655	

The last four orders are too scantily represented to be compared with those of our fauna, and even the Hemiptera are scarcely numerous enough to afford a basis of comparison.

The Coleoptera and Hymenoptera, however, seem to warrant a few remarks, as a supplement to my former very imperfect paper, and I have therefore prepared tables showing the number of genera and species in the families represented in these orders.

COLEOPTERA.

FAMILIES.	GENERA.	SPECIES.	FAMILIES.	GENERA.	SPECIES.
1 Cicindelidæ	1	6	19 Cleridæ	1	1
2 Carabidæ	24	39	20 Lucanidæ	6	9
3 Dytiscidæ	3	7	21 Scarabæidæ	21	44
4 Hydrophilidæ	4	4	22 Spondylidæ	1	1
5 Silphidæ	5	8	23 Cerambycidæ	21	25
6 Staphylinidæ	9	10	24 Chrysomelidæ	53	63
7 Cucujidæ	11	17	25 Bruchidæ	1	5
8 Endomychidæ	3	4	26 Tenebrionidæ	8	12
9 Coccinellidæ	1	2	27 Cistelidæ	1	1
10 Mycetophagidæ	1	1	28 Lagriidæ	1	1
11 Dermestidæ	1	1	29 Anthicidæ	3	4
12 Nitidulidæ	3	3	30 Meloidæ	2	3
13 Trogositidæ	2	2	31 Rhynchitidæ	4	11
14 Derodontidæ	1	1	32 Attelabidæ	2	5
15 Elateridæ	8	13	33 Otiorhynchidæ	10	13
16 Throscidæ	1	1	34 Curculionidæ	12	18
17 Bostrichidæ	5	7	35 Calandridæ	2	2
18 Lampyridæ	3	3	Undetermined	7	7
			Total	222	354

About seventy-five per cent. of the genera occur in Canada, and while probably not more than half a dozen species are common to the two countries, there is on the whole a striking similarity of form and ornamentation, with a sprinkling of conspicuously exotic looking individuals. One such species is found in the Cicindelidæ (*C. chinensis* var?) which was abundant on the Usui Toge, about one hundred miles northward from Yokohama, and still more so at Chofu, near the straits of Shimonoseki, several hundred miles southward. This beetle is very gaily coloured and appears very brilliant when flying or running in the sunlight.

In Carabidæ the striking genus Damaster is represented by two species (probably *D. pandarus*, and *D. blaptoides*), from Chofu and Yokohama. There is a very fine Carabus, and among species closely resembling American forms may be mentioned two of Scarites, a Panagæus, a Dromius, and four or five of Calathus. Water beetles were not searched for, but among the few obtained are three fine species of Cybister and a Hydrophilus more robust in form than our *H. triangularis*. Staphylinidæ were not numerous, although the few species represented apparently furnish one which occurs in Canada, viz., *Oxytelus fuscipennis*, which flew into our chamber at Nikko one damp evening in great numbers, and a species more like *O. rugosus*, of which one specimen only was taken. Although the Histeridæ are not represented in my collection, I captured on Enoshima (island famous for glass sponges, shells and marine curiosities) a species much larger than any of the American forms known to me, but the specimen was afterwards lost.

One of the coasting steamers upon which we spent a day or two, swarmed with *Silvanus surinamensis*, and afforded also another cosmopolitan species, *Necrobia rufipes*. A few specimens of Derodontus beaten from foliage at Yokohama, are perhaps identical with *D. trisignatus*, which occurs in British Columbia. A curious Trogositid of a bronzy colour, with two yellow tubercles on each elytron, might from its size and sculpture be readily mistaken at first sight for a Buprestid near Chrysobothris. The splendid buprestid *Chrysochroa fulgidissima*, brilliant green with purple stripes on thorax and elytra, is not uncommon in the forest regions of Nikko and Hakone, and is said to infest several trees, including the Keaki (*Zelkova Keaki*) which furnishes very valuable timber. There is also a smaller Chrysochroa, more subdued in colour, but still a very handsome insect, which appears to be less abundant. From the mountainous province of Shinshiu (famous for its silk-worms) I have two examples of a fine Chalcophora, much like *C. fortis* in sculpture, but larger.

The family Lucanidæ (Stag-beetles) affords several fine species, which quite overshadow the Canadian representatives of this family, while species of Scarabæidæ are both numerous and attractive, the most remarkable being the colossal *Xylotrupes dichomotomus*, of which the male has a long bifurcated horn on the head, and a shorter cleft one on the thorax. This fine species is apparently common in some districts, and good specimens can be obtained for three or four *sen.* At Hakone I obtained a living male, and at Yokohama picked up a dead female upon one of the Bluff streets. Several species of Anomala, Strigoderma, Euryomia, etc., were very abundant and did immense damage to various crops and to trees and shrubs. The most brilliant beetle of this family is a magnificent Geotrupes, of which I found several on the path from Hakone to Atami. Some of the Cetoninæ, however, vie with it in splendor and are perhaps more beautiful. I have not at hand *Spondylis upiformis* with which to compare the Japanese species, but it is very like the European *S. buprestoides*, with the costæ of elytra more elevated and the punctuation somewhat less dense.

The Cerambycidæ are very fine, and this family shows less resemblance to our fauna than perhaps any other, while still containing some familiar genera. A common species in the coniferous forests, and which I took upon pines on Fuji, is a glossy black beetle with white markings (*Melanauster Chinensis*, var, *macularia*), about the size and shape of our large pine-borer (*Monohammus confusor*). An allied species also from the forest at foot of Fuji, is *Apalmna liturata*, Bate, prettily marbled with grey and black, and with antennæ three inches long.

The profusion of vegetation naturally leads to a rapid increase of leaf-eating forms, and the Chrysomelidæ are correspondingly well represented in species and individuals, exceeding in these respects as well as in number of genera all the other families represented in my collection. While many of the species are pretty and of considerable interest, none are remarkably large or conspicuously colored. Other families are poorly represented until we come to the Rhyncophora, when numerous interesting forms are found. Rynchitidæ and Attelabidæ seem especially numerous in comparison with Canadian species, while Otiorhynchidæ and Curculionidæ have each some large and curious species, although the genera closely resemble our own. The pine woods yielded some fine species of Hylobius and closely allied genera.

Hymenoptera.

The members of this order have a more homelike look than the beetles, and very few genera occurred which are not represented with us, as will be seen by the following list of the genera and number of species in each family:

I. *Tenthredinidæ*,—Hylotoma 6, Cladius 1, Nematus 1, Harpiphorus 2, Aneugmenus 2, Athalia 3, Allantus 1. Macrophya 1, Tenthredo 1, Taxonus 2, Strongylogaster 1,

II. *Cynipidae*,—Aspicera 1.

III. *Ichneumonidæ*,—Ichneumon 8, Amblyteles 1, Trogus 2, Hemiteles 2, Ophion 1, Thyreodon 1, Anomalon 1, Campoplex 2, Paniscus 2, Limneria 1, Mesoleptus 1, Tryphon 1, Theronia 1, Pimpla 3, Glypta 1. Genus near Glypta 1, Lampronota 2, unplaced 2.

IV. *Braconidae*,—Bracon 1, Rhogas 1, Orgilus 1, Phylax 2, Apanteles 1, unplaced 1.

V. *Chalcididæ*,—Chalcis 2, Stomatocera 1, Lelaps 1, Eurytoma 3, Tetrastichus 2.

VI. *Proctotrypidæ*,—Proctotrypes 1, Goniozus 1, Sparasion 1, Macrotelia 1.

VII. *Chrysididæ*,—Chryis 1.

VIII. *Formicidæ*,—Camponotus 1, Formica 2.

IX. *Myrmicidæ*,—Myrmica 2.

X. *Mutillidæ*,—Sphærophthalmia 1, Chyphotes 1, Myrmosa 1.

XI. *Scoliidæ*,—Tiphia 3, Scolia 2, Dielis 4.

XII. *Pompilidæ*,—Pompilus 5, Priocnemis 1, Planiceps 1, Agenia 2.

XIII. *Sphecidæ*,—Ammophila 6, Spex 1.

XIV. *Larridæ*,—Lyroda 1, Larra 3.

XV. *Philanthidæ*,—Cerceris 3.

XVI. *Pemphredonidæ*,—Cemonus 1.

XVII. *Crabronidæ*,—Crabro 1.

XVIII. *Eumenidæ*,—Eumenis 4, Odynerus 4.

XIX. *Vespidæ*,—Vespa 3, Polistes 4.

XX. *Andrenidæ*,—Parasphecodes 1, Halictus 7, Andrena 5, Nomia 1.

XXI. *Apidæ*,—Celioxys 1, Megachile 3, Lithurgus 1, Ceratina 2, Synhalonia 1, Xylocopa 1, Bombus 5, Apis 1.

In all there are eighty two genera represented by 162 species. The Saw-flies number twenty-one species, but are exceeded by the Ichneumons with thirty three species, including several fine forms. The Ophion has chitinous spots in the sub-marginal cell as in *O. purgatum*, and the Thyreodon is identical in colour with *T. maria*, but is more coarsely sculptured. The two Chalcis are *C. minuta*, Linn, a cosmopolitan insect, and *C. mikado* a handsomer species which was not rare on lawn shrubberies. Ants were seldom collected, so that the few specimens taken give no indication of the abundance in which these insects occurred at some places. The species of Tiphia and Dielis were very abundant, the former on umbelliferous plants at Hakone, the latter on lawns. One Pompilus seems identical with our *P. biguttatus* and the others much resemble American species. The species of Odynerus are larger than ours, and several individuals were found to be stylopized. Two of the wasps are very large and build immense nests, while Polistes were very abundant, building their nests in shrubberies. Among the bees is a very large Lithurgus, which apparently used the leaves of Wisteria for its nests, and a Bombus which seems identical with *B. lapidarius* of Europe.

NOTES AND QUERIES.

By Rev. W. J. Holland, Ph. D., Allegheny, Pa.

I have just received a specimen of a *Erebus odora*, which was captured last Wednesday evening in the lecture room of the First United Presbyterian Church in the City of Allegheny, where its appearance caused no little consternation among the devout "Mothers in Israel," who were at prayer meeting, and who thought it was a bat, of which evil things are said by the unsophisticated. It is a male in good case. This is the third specimen I have received this summer. The first was taken about four weeks ago in the cellar of my father's residence in Bartholomew County, Indiana. The second was taken at Jeannette, Pa., near a spring house. All three specimens are fresh in appearance, as if not long from the chrysalis. Undoubtedly this great moth is more than an occasional visitor from the tropics, and should be reckoned as belonging to our fauna, though scarce. Its capture has been recorded north of the Ohio and Potomac many scores of times, and it has been taken repeatedly in Canada.

Papilio Cresphontes, Fig. 26, for the first time, has been taken this summer in the neighborhood of Pittsburg and in considerable numbers. One collector obtained four specimens in one locality. The food plant is Zanthoxylum and Ptelea in these parts. In Florida its larva is abundant upon the orange and lemon trees.

One of the commonest of our Papilios is *Philenor*, Fig. 27. Here its larva is found upon Aristolochia. In southern Indiana, in Bartholomew County, I have observed it summer after summer, sometimes in immense numbers. It is one of the commonest butterflies there as here. But, with the exception of one or two specimens of Aristolochia growing about verandahs in the Village of Hope, I think I may safely say there is not a plant of Aristolochia within many miles of the fields in which I have counted the perfect insect by the score. What is the other plant upon which the larva feeds? It runs in my mind that I have read that the caterpillar has been found upon the smart weed (*Polygonum hydropiper*) but I cannot recall where I have seen this statement made. I have never been able to verify it by observation. Perhaps some reader of the *Canadian Entomologist* may be able to throw light upon the subject.

The banana merchants in our town have proved themselves possessed of curious entomological stores. I have received from them a couple of living tarantulas, and not long ago a living specimen of *Caligo Teucer*, which had emerged from a Chrysalis, hidden

Fig. 26.

in a bunch of bananas. The insect had been transported by sea and land from either Honduras or some port in the northern portion of South America, a journey of several thousand miles. This reminds me that in several consignments of eastern lepidoptera I

Fig. 27.

have found one Danais plexippus, Linn. One of the sendings was from Borneo, the other from Java. We shall soon hear of its domestication on the mainland of Asia, and it will probably spread all over China and Japan. The insects taken by the U. S. Eclipse

Expedition of 1889, at the Azores, numbered among them two specimens of the butterfly. There were only about a dozen specimens of insects taken at the Azores by the industrious (?) naturalists of the party, and I judge that it must be common there. Why we have not yet heard of its domiciliation on the African continent is a mystery to me. It will, no doubt, get there before long.

I have a specimen of Limenitis taken in Warren County, Pa., this summer, which is most remarkable. It has all the markings of L.ursula, but both the primaries and secondaries are crossed by very broad white bands as in L. Arthemis. It is, however, larger than any specimen of Arthemis I have ever seen, and exceeds the majority of L. Ursula in size. It has the white spots in the cell of the primaries, which appear in some female specimens of L. Weidemeyeri. It is altogether a queer beast combining the characteristics of three of our species. No doubt they all sprang from a common ancestry, and this specimen reveals the force of atavism.

THE DRAGON-FLY.

By T. J. MacLaughlin, Ottawa.

As Economic Entomology has become so important a subject to the farmer, fruit-grower, gardener, and others, and as all insects are now regarded as either noxious or beneficial, a few words in reference to the Dragon fly might not, perhaps, be without interest, and might assist those who may not be conversant with its habits in assigning it a proper place in the field of economy.

The dragon-fly family—*Odonata*—belongs to the order *Pseudo* (or false) *Neuroptera*. That is to say, to that order of mandibulate insects having four membranaceous reticulate wings, and which undergo an incomplete *metamorphosis* or transformation.

The family is divided into three tribes: *Agrionina*, *Aeschnina*, and *Libellulina* and these again into sub-divisions.

The first tribe, *Agrionina*, embraces all the smaller forms—commonly called hammer-heads—and some of the most beautiful of the whole family, such as the different species of Calopteryx, as the name implies. *C. maculata*, *C. virginica*, *C. aquabilis*, etc.

The wings of all the species of this genus are densely reticulate, broad at, or near, the apex, or tip, and very narrow at the base, with many anticubital veins, and the pterostigma wanting in the males; the color of the wings varies according to the species—jet black, brown, hyaline, semi transparent and clouded, and the head, thorax and abdomen are of a light green or blue. From their erratic course, the color and comparatively slow motions of their wings, and habit of alighting so frequently, they are readily mistaken for butterflies. They proceed from and spend their life along swift running waters, especially such streams as flow through woods or shaded places; while the other insects of the same tribe—the Agrions, etc., proceed from and frequent only stagnant pools, or the borders of very sluggish streams. This tribe is composed of two subfamilies and two legions, with many genera, subgenera and species, all presenting the same peculiarities—slow, graceful flight and delicate constitutions. The noiseless, gentle movements of these pretty little objects (and they are sometimes found together in vast numbers) dressed in many colors, is truly a picture of combined beauty, ease and contentment, rarely seen. Thousands of the small creatures might float through the air about the ears of the beholder and not a sound could be heard to indicate their presence. They show their affection for each other in the most impassionate and gentle manner; the male, with the little forceps at the extremity of his abdomen, clasps the female gently about the neck, and in this way they fly away on their hymeneal wanderings in the same slow and careless manner which characterizes their movements when flying alone.

Fig. 28.

Tribe II., *Aeschnina*. This tribe is sub-divided into two families: *Gomphina* and *Aeschnina*. The latter contains the largest and most repulsive of the dragon-flies. The head is large; the eyes are connected from near the labrum, or upper lip, to the upper part of the head and cover both sides down to the jaws, or mandibles. The mandibles are large and powerful and the thorax is of immense proportions. The abdomen is long and slender, and upon capture the insect will coil and slash it about, which always gives the capturer the impression that it is feeling for a place to sting. The wings are broad and strong, and have little of the colors which beautify those of the other tribes. *Aeschna heros* is the largest of the species; it measures about 3½ inches in length, including the appendages, and the expansion of the wings is about 4 inches. The insects of the first tribe—Agrionina—fly low and are seldom seen far away from their natural haunts, but nearly all the species of Aeschnina are high fliers and are met with everywhere, in the woods, fields, on the tops of mountains and in the valleys, continually searching for food; devouring every soft-bodied insect which crosses their path, and looking for more.

Fig. 29

Fig. 30.

Tribe III., *Libellulina*. This tribe is divided, like the preceding, into two subfamilies, Cordulina and Libellulina. The Canadian genera are Macromia, Epitheca, Cordulia, Plathemis, Libellula (Fig. 29, *L. trimaculata*), Diplax (Fig. 28, *D. Elisa*: Fig. 30, *D. Berenice* male; Fig. 31, *D. Berenice*, female), and Nannophya (Fig. 32, *N. Bella*). The prettiest of all our large dragon-flies belong to this division. They are less repulsive and voracious than those of Aeschna, and the wings of most of the species are beauti-

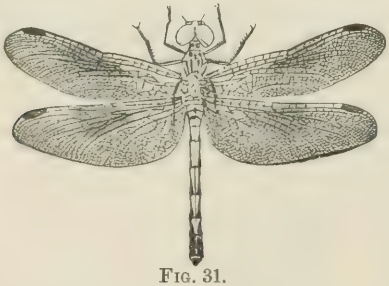

Fig. 31.

Fig. 32.

fully marked with clouds of various hues. They are readily distinguished from those of the second tribe—although nearly equal in size—by the abdomen alone; this member is not capable of being coiled up; it is comparatively short, stout at the base, and gradually tapers off to the end. The segments are joined closely together and the whole moves, to a very limited extent, up and down on the first segment, after the fashion of the moth and butterfly.

With this short and very imperfect description of the three tribes in the perfect, or winged state, something may now be said with regard to the earlier stages of their existence. Dragon-flies are then wholly aquatic animals and are carnivorous in all their stages. The parent fly lays her eggs in the water; some drop the eggs in while flying over the water; others submerge the abdomen and glue the eggs to reeds or sticks, while certain species go below the surface several inches for the same purpose. It is not definitely known how long the eggs are in hatching, nor the length of time the young remain in their larval and pupal states, but the water period of existence is variously stated to be from one to three years, the time varying according to the species. It is known, however, that they all feed upon other aquatic forms of animal life, to a large extent upon the larvæ of the mosquito, etc. The larva (Fig. 33, left hand), can only be distinguished from the pupa (Fig. 33, right hand), by the latter having wing pads, the insect being equally active in both stages. When the pupæ are ready for transformation they crawl out of the water upon the stems and branches of plants, secure a firm hold and remain until the skin is dried, which then

Fig. 33.

splits on the back and the perfect insect comes slowly forth, leaving the hull or pupa case clinging to the plant. Many of these may be seen long afterwards in the same position on reeds and grasses, along the borders of streams, ponds, etc. After coming from these a short time is required to dry and expand the wings; then away flies this beautiful creature, with gauzy wings of many colors, which, but a few moments before, was a horrible, repulsive, voracious object, crawling over the slimy bottom of a filthy pool of stagnant water. Some of the larger species of these insects are very sluggish in their larval state, and on this account nature has endowed them with a very remarkable weapon (Fig. 33 left), which enables them to capture their prey in this and their pupal state, as readily as they can afterwards do upon the wing. It consists in a prolongation of the under lip, which is very long and shaped like a ladle, the end terminating with two incurved hooks or mandibles. When the insect is at rest this elongated lip is folded and concealed beneath the under jaw until some luckless creature comes within striking distance, when out slips this trap like apparatus (against which its victim has made no provision) and secures the booty.

With regard to their manner of breathing, Duncan, in his work on the transformation of insects, says: "The larvæ and nymphs, although living under water and must respire, have no external organs by which they can breathe. Their method of respiration

is unique ; they breathe with their intestines. The large intestine is covered with numerous tracheæ, and when the animal wishes to breathe it opens the orifice of the intestine and admits a quantity of water. This, of course, contains air mechanically suspended which is taken up by the tracheæ just mentioned." In expelling the water just taken into the intestine, it is sent out with considerable force, which propels the animal forward with a jerk, several times the length of its own body ; by this means it keeps out of the way of its enemies.

Dragon-flies are the most harmless creatures in existence, utterly incapable of injuring man or beast, but, on the contrary, highly beneficial in all stages, inasmuch as they are the natural enemies of the mosquitoes, house-flies, moths, and other noxious insects, which would abound in greater numbers and interfere much more seriously with our comfort and our products than they do under the continuous and effective check of the dragon-fly. Yet, strange to say, these insects are not known by five-tenths of the people of Canada, and most of those who know them by name are not acquainted with their habits, but—to quote from a previous article on the subject—" Avoid or destroy them on account of the mistaken impression which some people have as to the poisonous effect of their sting, or the childish tradition as to their habit of sewing up the eyes and then stinging their victim to death." Others admire them for their beautiful colour, slender forms and graceful motions.

They are known by various names and epithets, such as : Devil's darning-needles, mosquito-hawks, horse-stingers and some others in English. The Germans call them Wasser-jung-fern, or virgins of the water. The Indian knows them by the name of Kow-ne-she, or Duch-kow-ne-she, and the French are pleased to style them Demoiselles. The last does not seem so appropriate as some of the other appellations, as the points in which any of these creatures resembles a lady, are not clearly defined, unless it be in their slender waists. I know that some of the large ants are called Demoiselles by the French, and their delicate forms rather suggest the name, but with all their admiration for the beauty and modesty of women, I agree with Duncan when he says : " No Frenchman would think of comparing a dragon-fly with a lady, if the nature of this animal was known " In this part of Canada dragon-flies begin to issue from their pupa cases about the midlle of May, the first appearing are those of the genus *Libellula*, and by the 10th of June all the different species may be found on the wing. After the middle of September they gradually disappear, but some of the hardy species, such as *Diplax hudsonica* and *Aeschna verticalis* and *venosa*, may be seen well on in November, apparently as vigorous as they were on starting out, and hungry enough to devour the elements.

It is interesting to know that even at this late date the Odonata is beginning to assert its personality, and the services so long rendered by this family of insects are now being observed, acknowledged and appreciated, not only by naturalists, but by many who do not pretend to make a study of the subject, as the following will show : A few years ago, while engaged in building the Lake Superior and Mississippi Railway, Dr. R. H. Lamborn, of New York City, had occasion to make frequent excursions, in the capacity of director and treasurer of the company, through the swampy forests around the head of the great lake, and his experience with the mosquito and other troublesome flies of that region was so impressive that he determined to array his own with all other natural forces against them. Having observed the activity of the dragon fly in the destruction of the mosquito, and also having witnessed an entomologist feeding a dragon fly that had eaten thirty house flies in rapid succession, without lessening its voracity, the thought came to him that the artifical multiplication of the dragon fiy might accomplish a mitigation of the mosquito and house-fly pests. He accordingly sought among entomological works for some account of experiments tending to throw some light upon the subject, but without the desired result. Finding that science had left those investigations almost untouched, and that there was nothing in the known life history of the dragon fly that would enable him to form an opinion as to the possible success of such an undertaking, he addressed letters to Dr. Uhler, of Baltimore, the highest American authority in the great class of insects to which the dragon-fly belongs, and Rev. Dr. McCook, another naturalist of high standing, and having received the greatest encouragement from both of those gentlemen,

as to the importance and possible practicability of his scheme, Dr. Lamborn at once placed $200 in the hands of M. K. Jesup, president of the American Museum of Natural History, New York, to be paid by him in three prizes of $150, $30 and $20 for the three best essays based on original observations and experiments on the destruction of mosquitoes and flies *by other insects*; the prizes to be awarded by Dr. H. C. McCook, Vice President of the Academy of Natural Science, Philadelphia, and Dr. J. S. Newberry, President of the New York Academy of Science. A circular was accordingly prepared in July, 1889, and sent to the working entomologists of the country, embodying the conditions and the object of the contest. The time given to respond was five months. It is not stated how many took part in the contest, but at the end of the time given, awards were made as follows: first prize to a lady, Mrs. C. B. Aaron, of Philadelphia, and the second and third equally divided between Mr. A. C. Weeks and Mr. Wm. Beutenmuller, both of New York City.

These three essays, with nine plates showing several species of dragon-flies, house-flies and mosquitoes in the various stages of development and the different devices suggested for the extermination of the mosquito, along with bibliographical lists of the authors quoted and literature on the subject, an article by Dr. H. C. McCook, and a letter from Capt. Macaulay, were published by D. Appleton & Company, New York, under the title of "Dragon-flies *vs.* Mosquitoes," in a handsomely bound octavo vol. of 200 pages.

Mrs. Aaron's experiment with petroleum is so interesting and valuable that we feel constrained to make the following quotation. On page 63 she says: "The United States Department of Entomology and the various State reports, as well as numerous entomologists abroad have long recommended the use of petroleum in some form for the extermination of plant lice and many other noxious insects. Petroleum emulsion, sprayed petroleum, the naphtha compounds and others from the same source, are prompt and deadly insecticides. With this in mind, we early began a series of tests with common illuminating oil on culicid *larvæ* under all circumstances. The narration of one series of experiments, typical of all, will illustrate the efficacy of this treatment. In a shallow pool of water with an area of ten square inches, five pupæ, two grown larvæ and about six others in various stages of development, were put, with them, also two immature Odonata, and a number of Cyclops and Cypris. On the surface ten drops of oil were placed and were observed to cover the whole area in ten minutes. At once great uneasiness was manifested by the larger larvæ. Then they all began cleaning off the breathing tube with their jaws, with apparent discomfort. The evident effect of the oil was to coalesce the cilia at the tip of the tube, thus making respiration difficult or impossible. The annoyance, fear, agony and finally desperate frenzy, were clearly depicted by their actions. The two grown larvæ were dead in eight minutes; several of the half grown died in ten minutes; at the end of twelve minutes most of the remainder, save the very smallest, had succumbed. The pupæ had both expired in fifteen minutes. In an hour and a half everything was dead except the Odonata and minute crustaceans; the former seemed to be in in perfect condition owing to their multitudinous breathing appliances. After the oil had been put on the above area, it was at once seen that the proportion was too great. A second pool of the same dimensions was tried with one drop of oil which was quite enough to have the same deadly effect, though the results were not so rapidly attained. The all pervading nature of the oil was shown by the fact that one of the larvæ removed to a pool of eight square inches of surface took enough oil with it to cause almost intense uneasiness to the inhabitants of the otherwise fresh water.

These experiments were tried time after time, always with the same result, and show conclusively to us that oil is the great hope of nearly every mosquito infested district, for the following reasons: (1) Its cheapness; (2) its deadly nature when applied to the culicidæ; (3) its comparatively harmless nature as applied to other forms of aquatic life; and (4) the ease with which it can be applied.

It is obvious that the time allotted was far too short to admit of much original observation or experiments along the lines of the scheme which brought forth the call for the contest. Had the time been two years instead of five months and the prize correspondingly great, the results would have been much more important and the conclusions

Mr. STEWART: We spend a great deal of money sometimes in inducing immigrants to come from the old country here and settle on these lands, and when they come here they find that they can't cut a stick of timber hardly on the lands they took up. Now if the law was changed so that when the land is sold to *bona fide* settlers the Government would settle with the lumbermen for that portion of the land, I think it would make immigration much better, as it is quite a hardship as it is now.

Mr. DRURY: I assure you that the question is by no means so simple as some of you imagine. If you propose to give the actual settler the right to cut timber, in a large part of this section where timber abounds it would simply mean that he would go in and take the timber and leave the land. I have had the opportunity of hearing this question discussed by some of the ablest men in this province, and I think as time presses and there is probably no opportunity to discuss this matter fully it would be better to defer it before placing ourselves on record. There can be no change now at the close of the Parliament, and it would be well to bring it up next year when due consideration might be given to it. In the meantime the members might obtain some information by which we could discuss it intelligently.

Moved in amendment by Mr. PRINGLE, seconded by JAMES SMITH, that this question be deferred till next meeting. Carried.

THE IMPROVEMENT OF OUR PUBLIC ROADS.

Mr. J. F. BEAM, of Black Creek, read the following paper:

Roadways in all parts of the world are at once both the means and the index, it is said, to the degree of progress and culture to which any people have attained.

In the earlier stages of civilization all transportation was carried on by footmen, or, when circumstances favored, by boats, like the Indian bark canoe or other simple craft. The next step in advance was pack animals, carrying both goods and human beings. Following the paths of footmen that were further worn by the feet of the beasts of burden, came the rudest possible roadways for wheeled vehicles, such as the natural surface of the ground affords. Step by step these routes were improved and more or less cared for between the main channels of communication, even in primitive times.

Gradually with the various social, economic and military demands of advancing civilization were developed those most wonderful highways of the Roman Empire, by which she attained and maintained her great prestige and power. These highways ran to Germany, Savoy, Hungary, Provence, Macedonia, Dauphane, Constantinople, along the Danube, and extended into England, Corsica, Sardinia, Sicily, Asia and Africa. At the time of Julius Cæsar the city of Rome was in communication with every large city of the empire by paved roads. Twenty-nine of these military roads extended out from the Forum, and nearly four hundred of the great highways crossed the empire a length of about fifty-three thousand miles. Consider, these were not common roads, but were paved throughout, and were noted for solidity. Many have been in constant use for nearly two thousand years, and in that time have often been tested by bearing loads of hundreds of tons, especially in the moving of obelisks and pillars, yet without injury. Pliny, the Roman author and lawyer, mentions the great strength of these roads, and the sewers underneath. They were built on scientific principles, and were always in the care of a man of great rank.

Later, in many countries about the beginning of the present century, the subject of road improvement received much attention, and to a marked extent also in our own. Macadam and gravel road companies were formed, and turnpike ways were built of ingress and egress for the scattered towns and villages and stage routes, to connect the more distant commercial centres. Some of these gravel roads, where toll gates have been removed, remain a valuable and permanent heritage at the present time.

The last advent of land routes is the most wonderful of all—the development of the modern railway, annihilating distance as it were.

Now it is a fact worthy of special note, that every advance in the method of land transportation has tended to destroy the earlier system of carriage. The plan of footmen or the carrying of burdens on the shoulders of men was quickly replaced by the use of pack animals. The disuse of pack trains followed the development of ordinary wagon roads, and in turn the people have been more or less completely induced to neglect their wagon ways by the advent of the more rapid railway. The latter so absorbed public attention that every town and village became ambitious to have railway connection.

But experience has fully shown that quite excessive and unfounded expectations were entertained as to the extent of benefit that may be derived from railways. Had the many municipalities that bonused railways expended similar amounts on well-constructed Telford or macadam roads would not their material interests now be far more advanced? It was long thought that railways would become so general that no extended system of wagon ways would, in time, be needed. But it is now clear and abundantly evident that, owing to the very great cost of constructing and operating the former, they can never fully take the place of the latter. We must, therefore, turn our earnest attention again to the proper development and care of the

Old-Fashioned Highways.

But many of the old toll gate gravel roads, being built for speculation, and apparently costing only a few hundred dollars per mile, were not properly raised, graded or macadamized. The nearest gravel was generally placed in the middle of the road, in too many instances without regard to size or the securing that first of all requisites, a permanently dry and solid foundation by proper drainage. Consequently during the rainy season or when the winter frost is leaving the ground, ordinary narrow tires, or even wider wagon tires, will drive the gravel down and badly rut and destroy the road. I had occasion to drive over forty or fifty miles of such gravel roads about a fortnight ago in Elgin and Oxford counties, just before attending the recent most successful and enthusiastic Dairymen's Convention at Ingersoll. On account of the open winter I found a continuous rut of three to six inches deep in the gravel, and yet toll gates and cheese factories were almost constantly in sight. The latter were all right, but the former were all wrong on such poorly constructed roadways. Such appears to be the condition of roads even in that justly far-famed dairy district, where the roads likely average as well or better than in any other part of our province.

Outside of the cities with their boulevards there is probably very little properly built and underdrained macadam or Telford highways in our country, and the average toll gate gravel roads in many places are only a means of oppressing the farmer.

All authorities agree that two rules must be followed in order to maintain good roads. "First, take the water out; second, keep the water out." With a properly constructed road the materials must bind together so compactly that the surface will shed water like a roof, and stand the destructive wear of all kinds of tires and weights of loads that it may properly be called upon to bear without injury. To properly build a macadam roadway, "broken stone from one to two and one half inches in diameter should be placed on the compacted bottom to a depth of three or four inches, and a ten or fifteen-ton steam roller passed over it four or five times. Then more broken stone of the same size should be laid on to a depth of three to four inches in the centre of the roadway, and two to three inches at the sides. This should be rolled by the steam roller until a hard bit of stone three to four inches in diameter, if it be placed on the surface of the roadway, will be broken by passing the wheel of the roller over it." By proper underdrainage an otherwise poor material will make a good roadway. Broken stone or gravel may constitute the wearing surface. But a harder kind of trap rock, such as is being used in New Jersey, Massachusetts and Switzerland, will wear more smooth and solid.

This brings us to the question of tires. Many persons think that the first step towards a road building and preserving agency should be to pass a general law regulating the width of tires, and that no road, however well constructed, will withstand the destructive effects of narrow wheels. The state of Michigan and other states and countries in late years, have passed such laws. But upon more thorough investigation it will be,

The section of systematic and biologic entomology consisted of a great number of cases showing different orders of insects which were not exhibited as a "complete series, but as samples taken from the actual collection to illustrate the methods employed in the arrangement of the regular systematic and biologic series, and also to give the visiting entomologist an insight into the present state of the national collection."

A collection of great interest was one prepared under Prof. Riley's direction by Prof. J. B. Smith, and was intended to illustrate all the families of insects found in North and South America. Every known family of insects on this side of the world is indicated in it. This collection is unique. It was intended as a synopsis of the families of American insects illustrated by the specimens themselves or drawings—in almost all cases the families are represented by specimens. The labels are all in Prof. Smith's handwriting, and together with the arrangement bear witness to the labour and care expended on them.

The next collection calling for mention was the collective exhibit of the agricultural colleges and experiment stations. This was made up of contributions from the entomologists of some of the State experiment stations, and showed great variety in the methods adopted and the excellence of the work. There were, of course, features of interest in all, but some were so far superior to others that they at once drew the attention of the visitor. Prof. Harvey, of Maine, sent five beautifully neat cases, illustrating by means of specimens and coloured drawings the work of the Apple Maggot. Prof. Hopkins, of West Virginia, provided fifteen cases of forest insects, which were put up very neatly with printed labels and good specimens of insects and their work. One case was devoted to parasites. Prof. J. B. Smith contributed an extensive collection, showing in ten cases the insects of the cranberry, grape, blackberry, sweet potato and squash. These were put up with Prof. Smith's usual care and labelled in a legible manner, which unfortunately could not be said for all the collections. One collection particularly, of eight cases of neatly arranged biological material, lost much in appearance from bearing large labels in ugly back-hand writing.

At first sight Prof. Smith's cases seemed too much crowded with specimens, but this was done intentionally to draw more attention, as he maintains that farmers for whom, after all, this sort of collection is prepared, will frequently fail to recognize a species if only one or two specimens are shown him : but, where, as for instance in the cranberry *Teras*, he is used to seeing swarms of them flying on the bog, a series of from twenty to thirty appeals to him at once, and he recognizes the insect. For the same reason large specimens of insect injury were introduced. A farmer is involuntarily attracted to a large specimen and to a striking injury. His eye is caught by seeing what was apparently a large vigorous plant badly damaged. The object is to give one seeking for information plenty to look at and abundant opportunity to examine the specimens. There is also another feature. If an insect is represented by only two or three specimens and perhaps one or two larvæ, it conveys the impression that these insects are rather rare, that it is difficult to get specimens. The object is to convey the idea that the insects shown are abundant and that they are to be respected from the point of the numbers in which they occur, if not on account of the size of the individuals.

In the exhibit of apparatus for entomology there are three more cases from the same station, showing insects injurious to Indian corn ; the apple, pear and quince ; and one of the Wheat louse and its enemies. These were meant to illustrate the manner of preserving all kinds of specimens and as a sample of the collection of an experiment station. No effort was made to have these complete—that would be impossible in the space—they were rather as a suggestion how a thing should be done than as an exposition of the subjects themselves.

Near the above mentioned cases was a sample of the Cornell case, in which everything is arranged on a separate block so as to facilitate removal if necessary. Without knowing the advantages claimed for this arrangement, it must be acknowledged, I think, that the general effect is less tidy than the ordinary method. There were collections from Prof. Bruner, of Nebraska, showing enemies of the sugar beet, several cases from Prof. Osborn, of Iowa, and six very neatly arranged cases of apple insects, together with coloured drawings of their work, prepared by Prof. Popenoe, of Kansas.

In connection with the agricultural exhibits of some of the States were several collections of insects. Minnesota showed specimens of Coleoptera, Lepidoptera, the bee moth, and injurious locusts, all well mounted and arranged. Several colleges and schools also made exhibits. The most important of these was that made by the Illinois State Laboratory of Natural History, under the direction of Prof. S. A. Forbes. This was a most instructive, well arranged and well prepared display. It illustrated the methods of work and lines of study pursued. Fronting on the main aisle was an office fitted for entomological work, such as might be occupied by an entomologist and two assistants, one for office and one for field work, and an antennensis, showing arrangement of tables and cases, all supplied with the necessary apparatus and reagents. Examples of the library, library catalogue, collections of all classes of material, records with their indexes and methods of keeping notes, also appeared here. A full set of the publications of the State laboratory and State entomologist's office were here displayed. The size of this room was twenty by twenty-seven feet. At the back of this office was a small section of an insectary, fitted with breeding cages for all kinds of insect life, sand tables, various insectary supplies and apparatus for experimentation and study in the contagious diseases of insects. This measured eleven by twenty feet. On the outside of the enclosure just described, and in adjoining cases are ranged the collections illustrating the various lines of work pursued at the State laboratory. The economic work is represented by four collections, one shows the insects injurious to the apple in all stages as far as obtainable, to the number of 176 species. It may be mentioned *en passant* that Dr. Lintner has now on record the names of 282 species of insects injurious to the apple. The second collection showed the injurious insects of corn in the same way, numbering 149 species; the third, those of wheat, fifty-seven in number, and the fourth, those of the strawberry plant, fifty species. The more minute forms are accompanied by exquisite water colour sketches, the work of the laboratory artist, Miss Lydia M. Hart, showing their appearance when magnified. The boxes are fifteen and a quarter by eighteen inches, and two and a half deep within. The front and back of glass, the sides of wood separable into two halves along the middle of the sides. The back is lined with sheet cork attached to the glass by a wax mixture, the cork covered with paper of neutral olive tint, which greatly enhances the appearance of the specimens. Half sized boxes are used where the space requires it. Studies on the foods of animals were represented by three collections. A most remarkable exhibit which drew much attention was that of the average food of a robin during the part of the year that that bird is in Illinois, as determined by percentages obtained from the study of 114 stomachs of these birds taken at all times and seasons. The quantity as well as the kind of each element is shown, and illustrates well the difficulty which sometimes meets one in determining whether a certain bird or animal should be considered beneficial or injurious. Eleven full-sized boxes are used, they contain 5,481 pinned specimens and 111 tubes of alcoholic material, mostly eighteen inches long, which is the full length of the box. Eleven of these tubes exhibit the vegetable elements of the food. A collection of insects found in the food of birds contains 199 species, and one of those found in the food of fishes includes ninety-one species. The insect fauna of the State is illustrated in two collections, the common insects of the State numbering 1,578 species, occupying sixty-nine cases. In nine boxes is shown the geographical distribution of the commoner Illinois butterflies, those occurring throughout the State, those peculiar to Southern, Central and Northern Illinois, those found also in Europe, in the Atlantic States, and in the Pacific States are separately grouped. A collection of 159 species of pinned insects is exhibited, which is one of forty collections lately made and distributed to high schools of Illinois which were in need of them.

Several collections of more or less interest were exhibited from foreign countries. Most of these were unnamed, consequently of no value for reference. Russia and Germany showed grand collections of noble insects. Canada was represented by a collection of about twenty cases prepared by myself, with the assistance of several members of the Entomological Society of Ontario, who kindly contributed specimens. The moths, filling eight cases, were arranged by Mr. J. Alston Moffat, and two cases of Hymenoptera by Mr. W. Hague Harrington. The collection of Diurnal Lepidoptera was probably one of

the most complete in Canadian species which has ever been brought together. When this collection is returned, it will become the nucleus of a collection at the Central Experimental Farm at Ottawa.

THE FIFTH ANNUAL MEETING OF THE ASSOCIATION OF ECONOMIC ENTOMOLOGISTS.*

The fifth annual meeting of the Association of Economic Entomologists was held at Madison, Wisconsin, in the Science Hall of the University of Wisconsin, on August 14, 15 and 16, 1893.

Sixteen members were present, as follows: President, S. A. Forbes; Second Vice-President, J. B. Smith; Secretary, H. Garman; J. M. Aldrich, G. F. Atkinson, G. C. Davis, C. P. Gillette, A. D. Hopkins, L. O. Howard, M. E. Murtfeldt, H. Osborn, C. V. Riley, P. H. Rolfs, H. E. Summers, F. M. Webster and H. E. Weed. A number of visitors and members of other scientific associations were present during the sessions, making rather a large attendance.

The following papers were presented, among them several from foreign entomologists, and the discussions were of the greatest interest.

The annual address of President S. A. Forbes reviewed the 115 economic articles containing new matter published by members of the association since the last meeting. These articles he grouped by subjects and by nature of outcome, thus giving an admirable idea of the work of the year in shape for the drawing of conclusions. He called attention to a narrowness of view and consequent inadequacy in the treatment of general questions, due to the want of comprehensive organization and systematic co operation. In his opinion the methods of publication and enforcement of results now in general use, fall far short of their final end. As a result the farmer has not responded to the suggestions of the investigating entomologist as might be anticipated. He suggested that more attention might be paid to describing the effects of insect work than to the insects themselves, subordinating the account of the insects. He insisted that instead of making an entomologist of the farmer we should make a farmer of the entomologist. He suggested distinguishing between the temporary and permanent presentation of facts in economic publications, advising the preparation of special economic summaries or monographs of all insects injuries to each of the various crops, and printing and distributing these summaries in great numbers. Co-operation in this particular line was urged. Addresses to Farmers' Institutes should be accompanied by a printed résumé to be distributed among those present.

"But now," to quote the language of the address, "supposing full and accurate information widely disseminated and in the actual possession of those for whom it is especially designed, we have next the most difficult task of all; to make sure that it will be practically applied. What shall we do and what advise to secure a common action in accordance with known and admitted facts? Shall we leave this to the individual and to the coercion of neighborhood opinion, or, these failing, shall we look to the law and to agencies established under the law? In short, are we practically individualists or socialists in our leanings? The official entomologist, I need hardly say, need not shrink from the word socialism, for as a Government official he is himself a socialistic product; as much so as the experiment station or the public school. Without attempting here to debate so large a question, I venture to express my own opinion that we should look to the law and to some regularly established system of inspection and penalty enforced by law to supplement the spontaneous agencies of society where these fail to protect the industrious and intelligent against the destructive consequences of neglect on the part of the idle and the

*Through the kindness of Mr. L. O. Howard, of the Division of Entomology, Department of Agriculture, Washington, D.C., who has furnished us with an abstract of the official minutes and also proofs of the full report, prepared for *Insect Life*, we are enabled to give this account of the meeting, together with some of the most generally interesting papers.—ED.

ignorant. There are regions—those parts of my own State worst infested by the Chinch Bug, for example—where there seems really to be no choice between legal compulsion on the one hand and the slow and enormously expensive operation of the law of natural selection on the the other. Either the slow processes of social and economic revolution must be allowed to take their destructive course, carrying down too often the bright and willing farmer with the hopelessly sluggish mossbacks all around him, who breed insects by the bushel to devour his crops with their own, or we must have a State or county board, acting in conference with the official entomologist, empowered to recommend a protective procedure in cases which are clear beyond all reasonable controversy and to assign penalties for a failure to conform. I would, myself, advise both State and county boards—perhaps those agricultural boards already existing—on the ground that it is useless to attempt to enforce measures, however plainly necessary, against the common sentiment of the locality."

He then spoke of the fact that the boundaries of the State represented by official entomologists are artificial, and that in consequence matters of distribution and other broad questions are seldom touched. This fact and the danger of unnecessary duplication of work, and other reasons, called for organization, and this organization should be of flexible form, leaving each individual free to meet the special requirements of his individual work, and at the same time helping to concentrate the surplus effort which should be contributed to the accomplishment of common ends. He suggested that a committee on co-operation propose a list of subjects in which co-operative effort is desirable. These subjects should then be attacked by volunteers, who should report to the committe. In this way, he thought, that the benefits of organization might be obtained without the surrender of individual initiative.

The address was discussed by Messrs Osborn, Smith and Webster. Mr. Osborn thought that laws requiring farmers to destroy insect pests appearing on their farms could be made effective, and gave the operation of the Canada thistle law in Iowa as an example. He thought that such laws should apply in all cases only to such pests for which good remedies could be recommended. The Fall Web worm could, he thought, be easily controlled in his State if everyone was required to destroy it whenever it appeared on his place.

Mr. Smith spoke of the difficulty of inducing many farmers to take any precautions in checking the injuries of insects, and thought that laws requiring them to give attention to such matters could not be enforced. The weed law of New Jersey was mentioned as an example of the ineffective working of such laws. He was of the opinion also that the number of laws required, if one were made for each pest, would be a difficulty not easily surmounted, since it was not easy to get legislators to pass such laws.

Mr. Forbes thought a community which would not enforce laws relating to farm pests must be left to suffer, but he had known instances where public opinion on these matters was such as to compel farmers to give them attention.

Messrs. Osborn, Smith and Garman were appointed a committee of three to consider the recommendations contained in the address.

Messrs. Edward H. Thompson, of Tasmania, R. Allan Wight, of New Zealand, and G. C. Davis, of Agricultural College, Michigan, were elected to membership.

Mr. Osborn presented a paper entitled "Methods of Treating Insects Affecting Grasses and Forage plants." In this paper he considered the insects affecting these crops by groups arranged according to the method of treatment, discussing particularly climatic conditions, natural enemies, agricultural methods, and the direct method. He presented a most interesting table of insects, showing in horizontal columns the food plants, number of annual broods and the condition in which the species is to be found during any month in the year, and closed with the following practical recommendations:

"(1) A general rotation of crops, especially for clover and for meadows generally, and change at the end of four or five years at the most.

"(2) Where it is desirable to keep the same field continually in grass or for a long series of years, as in rough land or woodland pastures, attention to the maintenance of trap lights, the use of arsenical baits or applications, burning, and the tar pan should be practiced, especially after the second year.

"(3) To allow ground squirrels, moles, and other natural enemies to carry on their work unmolested, and in case their multiplication affects surrounding crops to adopt means of protecting such crops without destroying these animals. If in localities where fertilizers may be used with profit, to adopt the use of such kinds as nay have insecticidal properties."

The paper was discussed by Mr. Hopkins.

The next paper, by Mr. Howard, was entitled "Notes on Methods of Studying the Life-histories of Injurious Insects," in which he described the vivarium methods in use in the Division of Entomology of the U. S. Department of Agriculture, but insisted that out-door work is preferable where feasible. The question of methods of ventilation of the insectary and kindred topics were discussed by Messrs. Forbes, Garman and Howard. Mr. Forbes thought that in-door work on life-histories should always be verified by out-door observation.

Under the caption, "Another Mosquito Experiment," Mr. Howard detailed as follows his experience, with the use of kerosene on the surface of mosquito-breeding pools, since his announcement of his first experiment a year ago.

ANOTHER MOSQUITO EXPERIMENT.

By L. O. Howard, Washington, D.C.

Just as "one swallow does not make a summer," one experiment does not fully satisfy the economic entomologist of the value of a remedy. At the last meeting of this association I laid before you the facts concerning an experiment in applying kerosene oil to the surface of a mosquito-breeding pool and argued from its results that in many localities where the breeding places are circumscribed, the mosquito plague may be largely averted.

The publication of this paper excited considerable interest in the subject and brought me some little correspondence from individuals who considered themselves advantageously located for the testing of the remedy on a larger scale than I had been able to attempt. Dr. Wooster Beach, of New York City, wrote last fall that it appeared to him quite possible to treat large tracks of land in the manner proposed, and solicited Government aid in locating breeding places in Westchester County along Long Island Sound, provided he could interest property holders and raise a small fund to be expended in the purchase of kerosene and the wages of men to apply it under expert supervision. The necessary aid was promised him, with Dr. Riley's sanction, and he made a strong effort to arouse the popular interest by articles in the local papers; but either through nonsusceptibility to mosquito poison on the part of his neighbors, or through indifference arising from other causes, he failed to collect the fund, and an interesting experiment on a large scale was thwarted.

Another very satisfactory experiment upon a small scale, however, has been made the present season. But before recounting the facts in the case I must advert to the chronic disinclination on the part of the property holders of a given neighborhood to admit that they are troubled by mosquitoes. I spoke in *Insect Life* last fall of a New Jersey mosquito remedy, recounting the killing by its means of seventy-five mosquitoes on the ceiling of my room in a New Jersey town, the name of which I thoughtlessly published. By the next mail, after the issue had reached that part of the country, I received letters from two residents of the town warning me that I would be mobbed by the inhabitants if I ever set foot in the place again, that is, provided my note should happen to be re-published in some more widely read journal than *Insect Life*. New Jersey and mosquitoes had been coupled in my mind since earliest boyhood, and I was totally unprepared to learn that our cultivated and refined neighbors were sensitive on the point.

However, after this experience I was not surprised to find that the gentleman who conducted the experiment which I am about to detail, desired his name, and particularly his locality, to be kept from the public eye. I may state, however, that it is within two hours' ride from the City of Washington, and that I have had an opportunity to verify the condition of affairs as reported to me.

The gentleman in question had seen in one of the newspapers some account of my Catskill Mountain experiments and wrote to me through a mutal friend in Washington for detailed advice in his own case. Correspondence elicited the fact that the mosquito supply must come from a small mill pond one-eighth of a mile from his house, from a small, marshy track above the pond, and from two horse troughs, one at his barn and the other at the roadside in front of his house. He had also a large rain-water barrel for which he immediately had a cover constructed at my advice.

The horse troughs were readily freed from "wrigglers" by using a small fine-meshed hand net every few days, and the kerosene treatment was used for the mill pond and the marsh. Estimating the surface area of the pond at 4,000 feet, he sprinkled on it 15 gallons of the cheapest kerosene. This formed a continuous layer, and remained evident to the senses, in the absence of rain, for two weeks. Three weeks after the application, which was made on the 4th of June, I visited the place and found that the kerosene was still operative, although a slight shower had fallen on the 17th day. No trace of a living aquatic larva of any kind could be found, and the surface of the pond was thickly strewn with dead aerial insects, among them many female mosquitoes.

A few straggling living mosquitoes were noticed about the house the first week in June, but none subsequently, and although the treatment was not repeated, none have been reported to have appeared during July.

The small marsh pools above the dam were treated at the same time, two gallons of kerosene being used for this purpose. The ensuing drought, however, dried these pools up thoroughly and vitiated the experiment. The total expense of the treatment was $1.70 plus two hours light labor for two men, and the result was immunity from mosquitoes for the household and vicinity.

This is a typical case of those which I had in mind when I expressed last year the opinion that there must be many localities where, by use of these simple remedies, the mosquito plague may be averted.

It may be well to add I had the pleasure of receiving, in May last, a note from Dr. Robert H. Lamborn, the donor of the mosquito essay prizes of two years ago, in which he says: "Your exact observation regarding the treatment of insect-breeding waters with petroleum is most useful and it seems to me to be new." I trust it is understood that no novelty is claimed for the idea, but that I have simply recorded these experiences as showing conclusively that the remedy is not a theoretical but a practical one.

Mr. Smith had known of two recent cases of the use of coal oil for destroying mosquitoes on Long Island, and stated that the results supported Mr. Howard's claims for the method.

Mr. Webster thought that the matter needed more experiment; that there was a prevalent opinion that mosquito larvæ in ponds appropriated a good deal of organic matter that would otherwise become offensive, and by destroying them it was possible to do harm instead of good.

The Secretary read a paper by Dr. Rilsema Bos, on "*Phytomyza affinis* Fall. as a Cause of Decay in Clematis." The larva of this little fly he had found to produce a disease spot on the stem a little above the level of the ground, causing the subsequent drying up of the stem. He found two generations of the fly each year, and advised the cutting off and burning of decaying stalks in early summer. Messrs. Hopkins and Garman reported similiar appearances in potato stalks and the terminal twigs of apple, which were probably due to a closely allied insect.

FARM PRACTICE AND FERTILIZERS AS INSECTICIDES.

By John B. Smith, Sc.D., New Brunswick, N. J.

It is safe, I think, to assume that every economic entomologist has been at times woefully disappointed at the outcome of what seemed the most promising experiments. Most of us have learned by sad experience that because a poison, or one used as such, acts well in one instance we can not be at all certain that it will act equally well in another. Many of us have run across insects that seem to eat all our usual insecticides with perfect impunity, or upon whom they act so slowly that they are practically of no effect I have in mind at present, from my own experience, the Rose chafer, *Macrodactylus subspinosus* (Fig. 34) of which many farmers claim, from experiment, that the arsenites do not injure it. I am not quite ready to agree to this, but I am certain that they act so slowly as to be useless.

Fig. 34.

Frequently we find insects whose life habits are such that we cannot reach them with insecticides, even if we have such as would readily kill them. Of such a nature is the "Boll" or "Corn worm," the larva of *Heliothis armiger*, which in tomatoes lives in the fruit, and in corn lives in the ear; in both cases safe from any application we can make. We have next a series of forms which in their injurious stage live in the soil itself and feed upon the roots of our crops. In cases such as I have mentioned our battery of poison is of little or no avail, because there is no proper opportnity to make use of it. We must adopt other tactics and, if possible, use preventive measures. These may be either positive, as where we cover a tree trunk with a substance mechanically protecting it from injury; or they may be more indirect, as when we change a crop, or plant late, or early, to avoid the period at which injury is done. This latter means of prevention is one which, in my opinion, is worthy of the closest attention and consideration on the part of entomologists. Not the mere planting early or late, but the question of so arranging farm practice as to avoid insect injury to the important crop. Insects have a life history which in the vast majority of cases is practically invariable. There is, usually, a fairly well-marked date of appearance, a tolerably defined period of adult life, and a normal period of development. The first and most important problem to be solved is the exact life history of the injurious species. That done, before the matter of insecticides is to be considered at all, the question should be: Can we avoid trouble or injury by modifying our practice without impairing quantity, quality, or price of crop? In many more cases then is usually believed a mere change of time will avoid injury. I do not claim any originality in this suggestion, and need only instance the fact that by a proper attention to the date of sowing, damage from the Hessian fly may be avoided.

Rotation of crops, if intelligently practised, will frequently prevent trouble when insecticides are out of the question. Our fellow-member, Mr. Webster, applied this principle in dealing with the *Diabrotica longicornis*, easily controlling what threatened at one time to become a very serious pest. Trap crops, planted principally to save the more important staple, are often available. For instance a full crop of late squashes may be obtained, free from the borer, *Melittia ceto*, if summer squashes are first planted and the Hubbards and Marrowfats somewhat delayed. The summer squashes will attract the vastly greatest percentage of moths to oviposition, and these may be removed after getting an early crop, filled with the larvæ that would otherwise have attacked the later vines. The proposition to use corn as a trap crop to prevent injury from the Boll worm to cotton has been forcibly urged by Mr. Mally in a recent bulletin from Dr. Riley's office. Methods of cultivation are frequently of use—as for instances in squashes again, where borers attack the vines near the roots. In fertile soil the joints may be covered at intervals and roots will be formed at every such joint sufficient to mature the fruit, even if entirely cut off from the original base of supplies. I have mentioned only a few instances to illustrate the suggestions made, and make no claim to originality so far as the principles involved are concerned. All have been applied by no means as often as they might have been, but

more often by far than the cases cited by me. The importance of fall plowing to destroy forms hibernating in the soil is not even suspected by many of our farmers, but need not be dwelt upon here.

In one other way much may be done to check many forms of destructive insect life—the scientific application of chemical manures, or fertilizers.

In the older States the natural fertility of the soil has long been exhausted, and it is necessary to supply the necessary plant food in some form. The traditional fertilizer is barnyard manure, and to this a very large proportion of the farmers cling as the only true material. Scientific experiments and investigations have shown that the necessary elements of plant food can be as well or better furnished in the shape of inorganic substances, and that they possess in many directions points of superiority over the traditional barnyard manure. In New Jersey the use of these chemical or "artificial" fertilizers or manures is annually increasing, and many of our best truckers, those that actually make farming pay, use nothing else. Merely as an instance of the result it may be recorded that the finest strawberries shown in Chicago this year were from New Jersey and were grown with chemical fertilizers only.

It occurred to me, some years ago, when I noted that farms where these chemicals were used were unusually free from insects, that they might have insecticide properties that could be very usefully employed. Peach orchards were then suffering quite severely from the *Aphis persicæ-niger*, which sapped the roots, especially of small and nursery trees, and my first experiments were directed to the question of the effect of kainit and muriate of potash on plant lice. I found them sufficiently effective to risk recommending them for use, particularly the kainit. Since that time almost every large grower of peaches in the State has dosed his infested trees with kainit, and I have not yet found an instance of failure where it was intelligently applied. How far stupidity can go is shown by a grower who carefully piled little hills of this material around his nursery trees, to make certain it should all get to the roots. He lost almost every one of his trees, though the application, if broadcasted, would have been considered a moderate one only. Of course the potash acted as a stimulant and supplied needed plant food; but even though part of the improvement was explainable in this way in some cases, yet it really made very little difference so long as the primary object, the destruction of the Aphids, is concerned.

In some sections of New Jersey the Corn Web worm has become somewhat troublesome of late years, and in this season of 1893 is worse than ever before. I have inquired and examined carefully in a number of cases, and in every case I found that where chemical manures were used injury was insignificant or entirely wanting, while in many other fields in which old methods were employed no stand was obtained after two or even three replantings, and the fields looked excessively ragged and uneven. In one of the bulletins of the Delaware Experiment Station this fact is quite evidently brought out, though not aimed at in the experiment made. Muriate of potash is less effective than kainit, but has very decided insecticide value. Nitrate of soda ranks close to kainit in effectiveness, and is peculiarly valuable as a fertilizer from the rapidity with which it becomes available as plant food, strengthening and stimulating growth as well as destroying insects. I have had opportunities several times this year to note wire worm injury on farms treated by chemical fertilizers as compared with those on which the usual routine was followed, and the verdict was always and vastly in favor of the chemical manures. No insects can live for any lengthy time in a soil saturated with these fertilizers, and I have tried all forms that have come under my notice. Mr. Fletcher found white hellebore very effective against the cabbage maggot, tried on a maggot that is found in diseased onions, hellebore was far inferior in its action to kainit or nitrate of potash. Truckers using these materials constantly are a unit in claiming practical exemption from cut-worm injury, which is often very severe on plant crops.

I have no desire to present statistics on this subject; these I will reserve for another occasion; my object will be gained by the few citations that have been made and which are examples of those upon which I base my faith that the intelligent use of fertilizers will be of very great aid in eventually freeing us from the injuries of many troublesome species.

This, combined with other intelligent farm practice will, I think, prove the main reliance of the farmer in future. Insecticides will and must continue to be used in some cases ; but in my opinion they have been sometimes relied upon to the exclusion of more radical measures.

The strength at which a substance proves effective, and its action on the plant, are matters of importance. Two hundred pounds of nitrate of soda and 600 pounds of kainit are not unusually large applications, and calculating this amount to onion rows I found that to make a thorough application I must use the nitrate at the rate of $5\frac{1}{3}$ ounces to 1 gallon of water, and kainit, 1 pound to 1 gallon. I made certain that these were effective insecticide mixtures, and then had one of our leading onion-growers try them over onion rows. They did not injure the plants in the least, either as to leaf or bulb, and as 10-foot rows were treated, injury would have been quickly noticed. Even the tender foliage of the rose will stand a solution of kainit at the rate of 8 ounces in 1 gallon.

As a matter of fact the solutions which come into contact with the insects are often saturated, and much stronger than the mixture given, for if the material is broadcasted or sown in the rows, each drop of water carries with it all that it can dissolve, and as the moisture evaporates, the mixture becomes just as strong as it is possible to be, and of course the insecticide effect is intensified.

I will close by simply referring to the fact that the phospates have no insecticide value so far as my experience has gone—not even the odorless phosphate, which has been put upon the market with the usual nostrum circular claiming that it would kill everything.

This paper was discussed by Messrs. Hopkins and Webster.

Mr. Hopkins thought it was a question as to whether the fertilizers really kill insects, or by giving plants increased vigour enable them to outgrow injures. He had observed in his practice on the farm that the use of stable manure on sod infested with white grubs and wire-worms had the effect or producing a good crop of corn when plowed under, while on adjoining land not fertilized, the attack of these insects was very destructive.

Mr. Webster had no doubt that fertilizers increased the vigor of plants, but thought that Mr. Smith had not demonstrated that they destroyed or drove away the insects.

The above papers were all read at the first session of the Association on the afternoon of August 14th. At the second session on the morning of the 15th letters were read from certain foreign entomologists regretting their inability to attend the meeting.

Mr. Garman presented a paper on the "Preservation of Larvæ for Study." He drops the larva into water heated to the boiling point, leaving it for 15 seconds. Then, when the body wall is somewhat rigid, he takes it up with the forceps and with a fine sharp scissors cuts a slit along the underside of the body, dropping it into the water for a few seconds longer. It is then transferred to 50 per cent. alcohol and in 12 hours to 70 per cent., and in 12 hours afterwards to 95 per cent. for permanent preservation. Shape, colours and structure are well preserved in this way. As a substitute for alcohol he recommends : boiling water, 250 cc. ; common salt, 3 tea-spoonfuls ; powdered alum, one teaspoonful; pure carbolic acid, 5 drops ; filter.

Mr. Forbes spoke of the preservation of fruits at the World's Fair and suggested that plants injured by insects may be preserved in the same way. Mr. Summers had found nothing which would satisfactorily preserve fruits. Mr. Osborn thought that aqueous preparations would freeze. Mr. Smith has employed with success methods similar to those of Mr. Garman.

A paper by Mr. Cockerell entitled, "The Distribution of Coccidæ," was read by the Secretary. He compared the Coccidae of the different West India Islands with the adjoining mainland, and spoke of the further distribution of a number of species which he had studied in Jamaica. Of 18 species found on that Island all but 3 are known elsewhere, and 11 have been detected outside of neotropical regions.

Mr. Hopkins presented his views on "Note and Record-keeping for the Economic Entomologist." He described the system which he has worked out and adopted and which

he has proved to be well adapted to the requirements of his work. The system consists of an accession catalogue and a species catalogue. Specimens of his cards or note pads were exhibited, and Messrs Smith, Osborn and Webster discussed the paper,—Mr. Webster giving in full his own system of note-keeping. Messrs. Smith and Osborn objected to the use of check-list numbers alone for species as adopted by Mr. Hopkins.

Mr. Garman's paper on "Illustrations for the Economic Entomologist" was next presented. He considers that the object of illustrations is to convey information and to save time in description, finish and technique, being, therefore, matters of secondary importance. The different methods of reproducing drawings were very carefully and fully discussed. Etching was considered in general impracticable as calling for a special method of drawing. Lithography was considered too expensive and wood-engraving is subject to liability of the engraver to misinterpret certain details of the drawing; but at the same time it was admitted that of our published figures, wood-cuts are the best. In spite of its disadvantages it is the most satisfactory method, although somewhat expensive. Cheap process figures are excellent for newspaper and other transient literature Their right in permanent literature and especially in scientific writings is questionable at the present time. No cheap process known to the writer gives good results in shaded figures. These figures give promise of something better in the near future. If it were not, however, for this hopeful outlook it would be well to return to wood-engraving. Entomologists were urged to make their drawings with extreme care and to adapt them to a particular process and not to rest satisfied with inferior reproduction. The paper was discussed by Messrs. Osborn, Weed, Smith, Hopkins, Gillette, Forbes and Howard

Mr. Gillette read a paper on "The Arsenites and Arsenical Mixtures as Insecticides." The article comprised a general summary, historical and critical, of the use of these substances in their different combinations. The paper was discussed briefly by Messrs. Beal, Wood and Galloway, all of whom were present at the meeting, although not members of the Association.

Upon invitation, Mr. B. T. Galloway, Chief of the Division of Vegetable Pathology, of the U. S. Departmnet of Agriculture, gave a short account of some recent work done in his Division upon a bacterial disease of melons and other cucurbits which had been found to be largely disseminated by the agency of insects, particularly of *Diabrotica vittata* and *D. 12-punctata*. Messrs. Webster, Smith and Garman had seen the same disease in their respective localities.

At the third session, held in the afternoon of August 15th, an amendment to the constitution was adopted, levying annual dues of 50 cents upon each member of the Association, and a resolution was passed authorizing the publication of the whole proceedings in *Insect Life* and the sending of an abstract to the *Canadian Entomologist*.

Messrs. Osborn, Webster and Weed were appointed a committee on nomination of officers. The following paper was then read:

DESTRUCTIVE SCOLYTIDS AND THEIR IMPORTED ENEMY.

By A. D. Hopkins, Morgantown, W. Va.

Within the last three years enough evidence has come under my observation of the destructive powers of Scolytid bark and timber beetles to convince me that they are among the worst enemies of our forest trees. In fact it is my belief that bark and timber beetles have caused the loss of more property, having a commercial value in West Virginia, within the last ten years, than that occasioned by any other single class of insects within the same time.

The destruction of our pine and spruce forests alone, resulting from the primary attack of a single species of bark beetle, has caused, since 1890, the loss of timber having a value of not less than a million and a half dollars.

Certain great devastations in the spruce forests of Maine, New Hampshire, New York, New Brunswick, France and Germany, since 1860, were evidently the work of

bark beetles, which, aided by timber beetles, not only cause the death of trees, but so damage the wood and hasten its decay that the timber soon becomes worthless, and in this country proves almost a total loss.

The destructive species of Scolytids may be divided into two classes, one class, including only a limited number, makes the primary attack, or prefers to enter the bark, roots and wood of living trees and other plants. The other class has a preference for injured, unhealthy, or felled trees, etc., the bark and wood of which these insects infest for the purpose of perpetuating their species. The first is primarily to blame for causing the death of trees, or at least a diseased condition, while the second is responsible for the death of the diseased ones and for causing the premature decay of the wood. All bark and timber beetles are, therefore, more or less destructive in their habits, their power of destruction depending more than anything else perhaps upon their numbers.

Nature has provided plant life with the power, to a certain extent, of resisting the attack of enemies and with natural means of healing wounds, recovering from disease, and other injuries occasioned by severe drought, cold, etc. Therefore, in order for a single species of insect enemy of a tree to attack and kill it, it must not only infest a vital part, but must occur in sufficient numbers to overcome all resistance. This is especially the case with destructive Scolytids, which, to accomplish this end, must enter the bark or wood of living trees, where they meet with the flowing sap, which offers the greatest resistance and is most difficult to overcome. Therefore, no single species of Scolytid bark beetle can cause the death of large or small forest trees unless occurring in immense swarms. In fact, it is doubtful if any single species could overcome the resistance thus offered by vigorous, healthy trees, without the assistance of numerous species of Scolytids and other insects which always come as reënforcements after the first attack is made. Hence, to cause a widespread devastation of timber, numerous species must work in concert. One species makes the primary attack and causes at once an unhealthy condition of the bark and tree. This diseased condition, if ever so slight, attracts other species to the affected tree. One or more kinds will attack the bark and wood at the base, others attack the bark at different points on the trunk, others infest the large and small branches, while still others enter the bark and wood of the terminal twigs, until the infested trees may be the hosts of twenty-five to forty species of Scolytids, each aiding the other in making the conditions favorable for the perpetuation of their species, and all contributing to the death and premature decay of their host.

Thus, through certain favorable conditions (the increased numbers of the species which are capable of existing in the green bark of living trees being the most favorable), an invasion may be started which in a few years results in the loss of millions of dollars worth of property.

The fact that the primary attack of one species makes the conditions favorable for the increase of others, which in turn contribute to the increase of the first, is an important feature to be considered, in our effort to discover methods of checking or preventing the ravages of this class of insects. If the number of those making the primary attack can be reduced below their power of causing a diseased condition of the trees, the trouble of which they are the primary cause must end. If, on the other hand, their undue increase can be prevented, invasions by them can not occur.

Thus, it is evident that, before considering a remedy against an invasion of Scolytids, we must discover the species to blame for the primary attack, and become as familiar as possible with its life history and habits, as well as the life history and habits of other species co-operating with it, and also study other causes which might contribute to or oppose the progress of their destructive work.

In the consideration of preventive measures against invasions of Scolytids, we must study the habits of the different species of the family in order to ascertain which of them are capable of causing diseased conditions of trees, or through increased numbers, their death.

During an investigation of serious trouble caused by these insects in our state, I have given special attention to these subjects. After discovering the species to blame for the

primary attack, and its principal aids in continuing the devastations, methods of checking the increase of the destructive kinds and protecting forests of healthy timber from their invasions were considered.

I was convinced from the first that no artificial remedy, such as cutting and burning the infested trees, the removal of the bark from the trunks, etc., could be successfully applied in our West Virginia forests. Therefore, my attention was turned toward the study of the parasitic and predaceous enemies of Scolytids, with a view of ascertaining the most desirable kinds with which to conduct experiments in utilizing them as a means of checking the increase of the destructive species.

An enemy of Scolytids was desired which would not have to depend on one or two species for its existence, but could readily adapt itself to different species and to varying conditions.

I found that while Scolytid bark beetles have numerous parasitic Chalcid, and Braconid enemies, few, if any of them, in my opinion, can be relied upon as introduced enemies to suppress or prevent an invasion of these beetles. I found, however, among their predaceous enemies, that the habits of certain species of the Coleopterous family Clerida were such, if these beetles occurred, or could be introduced in sufficient numbers in the infested forests, this would certainly have the desired effect.

In my search for literature regarding native and European Clerids, I found, in a report upon forestry, by F. B. Hough, 1882 (p. 264) as copied from a special publication of the French Forestry Administra, in connection with the Universal Exposition at Paris, that a European species, *Tillus formicarius*, was mentioned as being a "foe of *Bostrichus typographus* that pursued them without mercy," during an invasion of these bark beetles in the forest of *Abies excelsa* in the Jura mountains, from 1868 to 1872. This led me to make further inquiries in regard to this and other European enemies of Scolytids, and on October 13, 1891, I wrote to my correspondent, Oberforster W. Eichhoff, of Strasburg, Germany, asking him to send me some pinned specimens of insects known to be special enemies of European Scolytids. At the same time I indicated to him my desire to introduce live examples of such species as in his judgment would prove beneficial in this country as natural enemies of *Scolytus rugulosus*, *Polygraphus rufipennis*, *Dendroctonus terebrans*, and *Dendroctonus frontalis*. Among the thirty one species of pinned specimens received from him on November 12, he mentioned *Clerus formicarius* as being "beyond a doubt the best destroyer of Scolytids."

On May 30, 1892, I again wrote to Mr. Eichhoff, mentioning the damage to our forests by *Dendroctonus frontalis*, and stated that I was very anxious to try the experiment of introducing *Clerus formicarius* into our forests as an enemy of this and other bark beetles. In his reply of June 26, he referred me to Director C. Schaufuss, of the museum at Meissen, Saxony, as one who could give me efficient aid in this matter. Upon further investigations of the ravages of the bark beetles in our forests, I prepared a special report, dated July 9, which was addressed to the principal owners of the spruce and white pine timber in West Virginia. In the closing paragraph of this report, reference was made to the successful introduction of the Vedalia into California, and the possibility of introducing in a like manner insects from Europe which would feed upon the destructive bark beetle. It was suggested that it might be necessary to make a special trip to France and Germany for this purpose, and that if the timber interests of the State would share in the expenses of such a venture, this object might be speedily accomplished. In reply to this communication six of the principal timber companies of the State responded with liberal contributions, and I was authorized to proceed at once to Europe for the purpose of studying the insect enemies of European Scolytids, and to collect and import to this country such species as in my judgment would prove efficient in checking the ravages of insects in our forests.

In studying the enemies of European Scolytids, I found, as in this country, numerous Hymenopterous and Coleopterous parasitic and predaceous species in company with the Scolytids in the bark of the infested trees, but realizing to the fullest extent the danger of introducing insects into this country which might prove injurious as well as beneficial, I took every precaution in the selection of the species. Out of quite a number of enemies of Scolytids observed and considered, only one, *Clerus formicarius*, was selected, primarily

on account of its being regarded as the greatest destroyer of European bark beetles; secondarily on account of the general opinion of entomologists and forest officials whom I consulted, and my own convictions from a personal study of its habits, that it would not be injurious.

The first examples of this European bark beetle destroyer collected by me were taken in the Hagenau forests of *Pinus sylvestris*, on August 29, in the first tree examined, and they were afterwards found common in the larva, pupa, and imago stages in their pupa cases or winter quarters in the outer bark of large and small trees which had been injured or broken by storm and heavy snow. The bark of these injured trees was infested principally by the common European bark beetles, *Hylesinus* (*Myelophilus*) *minor*, Hart, and *Hylesinus* (*Myelophilus*) *piniperda*, Linn. The larva of the Clerid had evidently been devouring the larvæ and pupæ of the latter species at a fearful rate, for in many instances scarcely one had escaped where there had apparently been thousands. The Clerid was also found under the same conditions in the forests near Meissen in the Kingdom of Saxony, and was taken from the bark of spruce logs in the Lauterbrunnen Valley in Switzerland, where they had been feeding on *Tomicus cembrae*, Heer.

Upon my return to this country, with something over a thousand specimens, a small colony of the beetles and larvæ were placed in a pine woods near Morgantown, on October 10, 1892, being the first examples set free in America. The remainder were successfully kept over winter in the larval and pupal stages, and between April 20 and May 10, they were distributed to the timber companies which had contributed to the expenses. Colonies of 25 to 100 were placed by me, or under my special supervision, on and in the bark of trees, logs and tops, where the conditions were most favorable for their propagation.

Eight importations, numbering 2,082 examples, have since been received from collectors in Alsace and Saxony, Germany, and the living examples have been sent to the timber companies in five different counties, with special instructions for their proper location in colonies in the same manner as first mentioned. In all 26 colonies have been placed in the different sections of our forests. The conditions surrounding each colony are most favorable for the Clerids to thrive and increase, and we have every reason to believe that they will do so under their changed conditions, but as yet we have no means of ascertaining to what extent they have multiplied, and, of course, it is too early to expect results.

There is one interesting fact, however, that I have observed this season regarding the destructive Pine bark-beetle, *Dendroctonus frontalis*, and that is that its numbers have been very greatly reduced since last fall, consequently at this time very little, if any, timber, is dying.

On the 24th of July, 1892, I found this species attacking and mining beneath the bark of living trees, in which they occurred in immense numbers. By the latter part of September a brood had emerged from the bark of the same tree while the leaves were yet green and those that had emerged were entering the bark of other living trees. In November the bark of the same trees were found to be infested by countless thousands of the insects in all stages from eggs to adults. Trees so affected subsequently died, but through persistent search in the bark of such trees in different sections of the State, I have failed, as yet this season, to find a single living example of *Dendroctonus frontalis*. Hence the trouble, as caused by this species, is evidently at an end in West Virgina, for the present at least.

No other species of Scolytids infesting the same trees seem to have been affected by the cause which it would seem has rendered *Dendroctonus frontalis* almost extinct. In fact the great number of trees that died last summer and fall were found last spring to be infested by immense numbers of bark and timber beetles of different species. These have since emerged, and it would seem that the only danger to be apprehended from a continuation of a trouble like that we have mentioned, would be from the attack of some of the species which have thus emerged from the dead trees, for it is evident that unless they find favorable conditions in the felled trees, tops, stumps, etc., in lumbering regions they must either attack and kill living trees or they must perish.

One species, the Turpentine Bark-beetle, *Dendroctonus terebrans*, has already made a desperate effort in this direction. Early in May the adults emerged from the trees in which they had bred, but failed to find dying trees, the bark of which they preferred to in-

fest for the purpose of depositing their eggs. Then followed a remarkable and interesting occurrence, probably never before observed in the life habits of this and other species of Scolytids. They with numerous other members of the Scolytid family, including both bark and timber beetles, must have started, with one accord, in search of more favorable conditions for their propagation, for they occurred in different sections of the State, at about the same time, in great swarms like migrating locusts. Specimens were sent to us accompanied by startling accounts of plagues of bugs that invaded mill yards, furniture shops, newly painted houses, etc. They were reported as coming like a hailstorm against the windows, and in at the open doors like swarms of bees, and that the air on all sides was full of them. During my absence from Morgantown (where our station is located) one of these migrating swarms of Scolytids invaded the town and occurred at certain houses and at furniture factories in such immense numbers that some of the people became alarmed. The report was started that Hopkins' German bugs had devoured all of the pine bugs and were going to prove like the English Sparrow, a universal pest. It was probably well for me that I was absent at the time.

The men were painting a new greenhouse at the station at the time, and the number of the beetles attracted to the building, evidently by the odor of turpentine, was so great that the men were exceedingly annoyed in their work. When I returned to the station, several days after, I found evidence of their numbers in the handfuls of dead beetles that failed to escape from the greenhouse.

Dendroctonus terebrans occurred in by far the greater numbers in these migrating swarms, and when they failed to find dying or injured trees they attacked living Pine of all kinds, Black Spruce and Norway Spruce, entering the bark at the base of the trees. Some of the trees thus attacked in May were examined July 15, and the bark near the point of the attack was found to contain parent adults, eggs, and full-grown larvæ, the larvæ occurring in great numbers surrounded by the flowing turpentine. Trees so attacked were still living, but the injury will probably cause a diseased condition of the trees, which will attract other species and result in their final death, thus we may be on the eve of a new destructive invasion like that which has just passed. Other species, like *Polygraphus rufipennis*, *Tomicus calligraphus*, and *Tomicus cacographus*, which are capable of existing in green, sappy bark, occurred in such abundance in the dying spruce and pine trees last spring that it is evident they must exist in the forests in great numbers, and are ready to attack trees showing the slightest indication of disease or weakened vitality, if they do not make a primary attack.

Therefore, this imported enemy will find abundant food and favorable conditions for its rapid increase in the infested bark of felled trees, tops and stumps in lumbering regions in which or near which the colonies have been placed.

This imported Clerid does not confine itself to one or two species of bark beetles in one kind of trees, but the adults, it would seem, will attack and devour the adults of any species of bark and timber beetles found in the United States, and their larva will feed on the eggs, larvæ, pupæ and young beetles of any species infesting the bark of pine and spruce trees. In fact, they are inclined to make themselves generally obnoxious to the little bark pests.

It would seem that all of the conditions necessary for the imported Clerid to multiply and become an efficient protector of our pine forests from future destructive invasions of bark beetles are most favorable. *Dendroctonus frontalis*, evidently the most destructive enemy of our pine forests, has, from some cause, been reduced far beyond its destructive powers. Other species which have depended upon it for the primary attack are, it would appear, somewhat demoralized on account of the disappearance of their benefactor. The large amount of felled timber found in the several lumbering regions will probably attract the larger portion of other threatening bark beetles away from the green trees, and by the time *Dendroctonus frontalis* can again marshal sufficient forces to successfully attack and kill the trees, they will, it is hoped, be met with a force of enemies led by the European Bark beetle Destroyer, which will successfully repel them and thus save our forests in the future from destructive invasions of bark beetles.

Mr. Smith, in discussing this paper, said that he thought the experiment entered upon in West Virginia well conceived, but thought that parasites did not greatly benefit the farmer. Mr. Hopkins, in reply, stated that it required enormous numbers of the Scolytids to kill the pine trees, and that his idea was to get some means of reducing the numbers of the beetles and not completely exterminate them. That parasites were a benefit to agriculture was, he thought, demonstrated by the irruptions of pests which took place when, by some means, they reached localities from which their parasite was absent.

PARASITIC AND PREDACEOUS INSECTS IN APPLIED ENTOMOLOGY.

By C. V. Riley, Washington, D. C.

The importance to man, and especially to the agriculturist, of the parasitic and predaceous insect enemies of such species as injure vegetation, has been recognized by almost all writers on economic entomology. Indeed, it is a question whether the earlier writers did not attach too much importance to them; because, while in the abstract they are all essential to keep the plant-feeding species in proper check, and without them these last would unquestionably be far more difficult to manage, yet, in the long run, our worst insect enemies are not materially affected by them, and the cases where we can artificially encourage the multiplication of the beneficial species are relatively few. While fully appreciating the importance of the subject, therefore, it is my purpose in this paper to point out the dangers and disadvantages resulting from false and exaggerated notions upon it.

There are but two methods by which these insect friends of the farmer can be effectually utilized or encouraged, as, for the most part, they perform their work unseen and unheeded by him, and are practically beyond his control. These methods consist in the intelligent protection of those species which already exist in a given locality, and in the introduction of desirable species which do not already exist there.

The first method offers comparatively few opportunities where the husbandman can accomplish much to his advantage. That a knowledge of the characteristics of these natural enemies may, in some instances, be easily given to him, and will, in such instances, prove of material value, will hardly be denied. The oft quoted experience which Dr. Asa Fitch recorded of the man who complained that his rosebushes were more seriously affected with aphides than those of his neighbors, notwithstanding he conscientiously cleaned off all the old parent bugs (he having mistaken the beneficial ladybirds for the parent aphides) may be mentioned in this connection. Other cases will recur to you, and I will mention one rather striking experience related by my assistant, Mr. L. O. Howard. The Army Worm (*Leucania unipuncta*) was overrunning a large and valuable field of timothy and threatened the destruction of the adjoining fields. The insect was as yet, however, circumscribed and susceptible of remedial treatment. The owner of the field, observing the buzzing swarms of the Red-tailed Tachina-fly, assumed that the fly was the parent of the worms, and as the former was an active winged creature, capable of extended flight, he concluded that remedial work was useless, since the flies could, and doubtless would, deposit their eggs over the entire surrounding country. As a consequence the worm was allowed to travel to the adjoining fields and the injury thus increased through ignorance of the fact that the Tachina flies were the most important of the parasitic enemies of the worm. For many years well-informed gardeners in parts of Europe have practised collecting ladybirds and some of the ground beetles to liberate upon plants infested by plant-lice or by cutworms The characteristics of these two families, Coccinellidæ, and Carabidæ, should be taught in our schools, as a definite knowledge of certain species, which is readily acquired, may often be turned to account in a limited way by the cultivator.

In a few cases like this there is no reason why the farmer should not be taught with advantage to discriminate between his friends and his foes, and to encourage the multiplication of the former; but for the most part the nicer discriminations as to the bene-

ficial species, some of the most important of which are microscopically small, must be left to the trained entomologist. Few of the men practically engaged in agriculture and horticulture can follow the more or less technical characterizations of these beneficial species, and where the discriminating knowledge is possessed, it can, as just intimated, only exceptionally be turned to practical account. Thus our literature on this subject in the past has been of interest from the entomological rather than from the agricultural point of view, as most writers on economic entomology have contented themselves with describing and illustrating such beneficial species.

In other cases much good may be done without any special knowledge of the beneficial forms, but as a result of a knowledge of a special fact which enables the farmer to materially encourage the multiplication of parasitic species while destroying the plant-feeding host.

The Rascal Leaf-crumpler (*Mineola indigenella Z.*) a common insect which disfigures and does much damage to our apple and other fruit trees, and which hibernates in

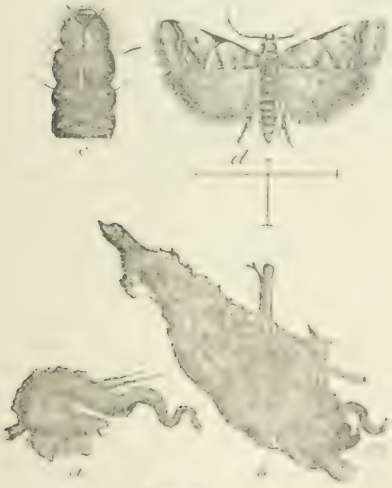

Fig. 35.

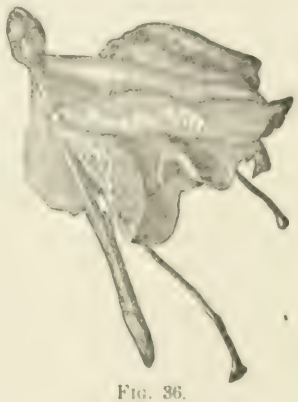

Fig. 36.

cases attached to twigs, is a case in point. (Fig. 35, *a* and *b*, represents the curious cases made by these worms; *c*, the head of a larva; *d*, the moth. Fig. 36, shows a case covered with a bunch of withered leaves). Many years ago I urged the importance of preserving the several parasites known to prey upon it, in the following language:*

> The orchardist has but to bear in mind that a (the last mentioned) is single brooded and that it passes the winter in its case, and he will understand that by collecting and destroying these cases in the dead of the year when the tree is bare, he effectually puts a stop to its increase. . . . Whether collected in winter or pulled off the trees in spring or summer, these cases should always be thrown into some small vessel and deposited in the centre of a meadow or field away from any fruit trees. Here the worms will wander about a few yards and soon die from exhaustion and want of food, while each of the parasites, hereafter mentioned, as are developed in the pupa state will mature and eventually fly off. In this manner, as did Spartacus of old, we shall the ranks of our friends while defeating our foes.

The practical value of this suggestion was subsequently fully demonstrated, and especially by the late D. B. Weir, who, at a meeting of the Illinois Horticultural Society, as secretary of a committee appointed by said society to consider the best means of securing co operation in the warfare against the fruit growers' insect enemies, announced that this policy had been followed with happy results

*Fourth Report, Insects of Missouri, 1871, p. 49.

A similar course was urged by me in the case of our common bag-worm (*Thyridopteryx ephemeræformis*) (Fig. 37.) This species, as we know, is also subject to parasites, and the bags or cases which are collected in winter, instead of being burned, should be allowed to remain until the middle of the next summer in some vessel well separated from trees and shrubs, in order that the young worms, when they hatch in spring from the eggs contained in the female bag, may perish, while the parasites develop and escape. Prof. J. H. Comstock has suggested in a similar way the placing of the hand-collected chrysalides of the imported Cabbage-worm (*Pieris rapæ*) in boxes covered with wire netting, in order to admit of the ready escape of the little Chalcid parasite (*Peteromalus puparum*) and at the same time retain such of the butterflies as may issue—a practice which had, I believe, been successfully employed in Europe. Other similar cases of this mode

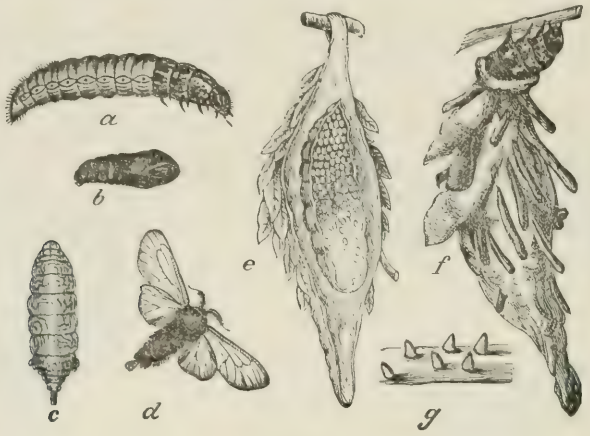

Fig. 37.

of encouragement will occur to you, but, as already stated, with comparatively few exceptions, such as those indicated, the multiplication of our parasitic and predaceous species on the line of the first method is practically beyond our control.

It is quite different in the second method of dealing with beneficial insects, for here man has an opportunity of doing some very effective work, and it is only within comparatively recent years that the importance of this particular phase of the subject has been fully realized. The Rev. C. J. S. Bethune, of Canada, was probably the first entomologist to suggest, in one of the earlier volumes of the *Canadian Farmer*, the importation of the European parasites of the Wheat Midge (*Diplosis tritici*) into America, on the supposition that this cosmopolitan species might thus be kept in check on this continent to the same extent that it was in Europe. So far ar I am aware, the attempt was never actually made, and though some subsequent correspondence was entered into between Fitch and Curtis, and later between Walsh and some of his English friends, nothing tangible resulted. The matter was, in fact, never seriously studied with this purpose in view.

The importance of this phase of the subject was early forced upon my attention, as it was upon that of others, and is frequently referred to in my earlier writings. Thus, in 1869-70, in studying the parasites of the Plum Curculio, it became evident that they were of such a nature that they could easily be trasported from one locality to another, and I distributed from Kirkwood, Mo., *Sigalphus curculionis* Fitch and *Porizon conotracheli*, Riley, to several correspondents in other parts of the State. I also urged a similar course with regard to some of the parasites of the Coccidæ, which it happens may be easily transported from one place to another in their undeveloped or adolescent stages.* Le Baron, in his studies of the Oyster-shell Bark-Louse of the Apple and one of its parasites (*Aphelinus mytilaspidis*) transported scale-covered twigs during winter from Geneva, Ill.,

* Third Rep., Ins. Mo., 1870, p. 29; Fifth Rep., do., 1873, p. 90.

to Galena, Ill., with beneficial results. The experiment was conducted on a small scale, but the parasites issued and became domiciled in their new locality, thus proving the practicability of his scheme. In neither of my experiments nor in Le Baron's, however, was sufficiently thorough examination made to prove that the parasites did not already exist in the localities in which they were colonized.

Planchon and myself introduced *Tyroglyphus phylloxera* from America into France in 1873,† and it became fully established, as subsequent correspondence and observation showed. In 1874 efforts were made to send over from England to New Zealand certain Aphid parasites to check the alarming increase of those plant pests there, and while I have no records at hand to show with what success, the later successful introduction of bumblebees to the latter country to fertilize the red clover is well-known history. In his report upon the parasites of Coccidæ in the Annual Report of the Department of Agriculture for 1880, Mr. Howard gave the subject some theoretical attention and elaborated upon the ease with which Coccid parasites could be transported from one part of the country to another during winter. He suggested the experiment of transporting *Dilophogaster californica* from the Pacific coast to certain of the Southeastern States, where it might be expected to prey upon certain large species of Lecanium. In 1883, after previous futile attempts by myself and Mr. Otto Lugger, and with the assistance of G. C. Bignell, Esq., of Plymouth, England, the living cocoons of *Microgaster glomeratus*, a common European parasite of *Pieris rapæ*, were successfully imported by the Department and the colonization of the species was established, not only in the District of Columbia, but in Iowa, Nebraska and Missouri, as specimens were simultaneously sent to the agents of the Division in those States.‡ It has become so widely distributed since then as to lead to the inference that it must have been previously introduced at some other points, though the spread of an introduced species, even when introduced at a single point, is often so rapid that it surprises us, especially of a species that is winged, as evidenced by the spread of the Horn Fly (*Hæmatobia serrata*) over the whole eastern United States in about four years. Later, in 1891, with the aid of Mr. Fred. Enock, of London, a successful effort was made to introduce into this country from England an important Chalcid parasite of the Hessian Fly, *Entedon epigonus*, Walker, (*Semiotellus nigripes*, Lind.). The details of this experiment will be found in my published writings, especially in my report as U. S. Entomologist for 1891, and it is only necessary to state at this time that parasitized puparia of the Hessian Fly were received in large numbers and distributed to various points, and placed in the care of competent observers in Illinois, Indiana, Michigan and Canada. The results so far have not been marked, and but one positive report as to the acclimation of the parasite has been received, viz., from Prof. S. A. Forbes, of Champaign, Ill. I am of the opinion, however, that the lack of evidence from other points is due almost entirely to lack of proper examination, and I have every hope that the species will before long be found to have obtained a secure foothold at all of the several points of introduction. It is a very difficult matter to ascertain the existence of a parasite of this minute size, except when it occurs in great numbers. It requires an eye trained not only to the examination of these minute creatures, but one familiar with the allied imported species and native species. The reason for attempting the introduction of this particular species was simply that in England it was found to be far more abundant and far more beneficial than any of our native species have so far proved.

The present year I have become interested in the matter of the importation of a predaceous Noctuid (*Erastria scitula*) which preys upon the Black Scale (*Lecanium olew*) in south Europe and helps materially to keep it in check. With the help of Prof. H. Rouzaud, of Montpellier, France, who has studied the habits of this insect with extreme care, I hope to establish it in southern California, where the climatic conditions are sufficiently close to those of south Europe, and where the Black Scale does great damage to olive orchards, and to oleander trees, and also affects less seriously the Orange and Lemon. The Black Scale has already an important enemy in California in the shape of the Dilophogaster above mentioned, but the latter is only two brooded and the scale insect, multiplying more rapidly, outstrips it in the race for maturity. The Erastria, on the

† Sixth Report, Ins. Me., 1874, p. 55.
‡ Report of the Entomologist in Rep. U. S. Dep. Agric. for 1884, p. 323.

contrary, passes through five or six generations in the course of a summer, and, as it is purely predaceous, it will, I believe, prove a most useful auxiliary against the Black Scale, especially if brought over without its parasites.

So far I have spoken only of the insects which have been imported into this country, but some effort has also been made in the opposite direction. Thus we have endeavored and with some success) to return the service done us by sending to Australia and New Zealand some of our predatory Coleoptera, some of the Pacific coast parasites of the Codling Moth, and a species of the interesting genus Raphidia, which also preys upon the Codling Moth.

In 1887 and 1888 the now well-known importation of *Vedalia cardinalis* from Australia and New Zealand to California, to prey upon *Icerya purchasi*, was successfully carried out. The history of this striking example of the beneficial results that may, in exceptional cases, flow from intelligent effort in this direction, is now sufficiently well known to American economic entomologists; but anticipating that we shall have foreign delegates among us, and that our proceedings will be published more widely than usual, it will, perhaps, be wise to give the salient historical facts in the case, even at the risk of some repetition of what has been already published. In doing this the indulgence of the society is craved for the prominence of my own part in the work, rendered necessary by the disposition in some quarters to distort the facts.

The Fluted Scale, otherwise known as the White or Cottony-cushion Scale (*Icerya purchasi*, Maskell) Fig. 38, is one of the largest species of its family (Coccidæ), and up to 1888 had done immense injury to the orange groves and to many other trees and shrubs of Southern California. From Australia, its original home, it had been imported into New Zealand, South Africa and California, the evidence pointing to its introduction into California about 1868, and, probably, upon *Acacia latifolia*.

Fig. 38.

In my annual report as U. S. Entomologist for 1886, will be found a full characterization of the species in all its stages; but the three characteristics which most concern the practical man, and which make it one of the most difficult species to contend with, are its ability to survive for long periods without food, to thrive upon a great variety of plants, and to move about throughout most of its life.

The injuries of this insect, notwithstanding the efforts to check it, kept on increasing, and some ten years ago I felt that the work of this particular species and of others which seriously affected the fruit-growing interests of Southern California, justified the establishment of agencies there. Up to this time no special entomological effort had been made by the Government on behalf of the fruit-growers of the Pacific coast. Through agents stationed, the one at Los Angeles, the other at Alameda, a course of elaborate experiments was undertaken as to the best means of treating the insects affecting the Orange there, and more particularly this Fluted or Cottony-cushion Scale. During the progress of these investigations, however, the fact impressed itself upon my mind that we had here an excellent opportunity of calling to our aid its own natural enemies, for while there were some doubts as to the origin of Icerya, the question was finally settled to my own satisfaction that it was of Australian origin, and that in its native home it was not a serious pest, but was kept subdued by natural checks. These facts were not positively ascertained without a good deal of correspondence and investigation, involving, in fact, a trip to France, as has been set forth in my published writings upon the subject.

In my report as U. S. Entomologist for 1886, in an address before the State Board of Horticulture at Riverside, California, in 1887; in a paper before the Philosophical Society of Washington in the winter of 1888, and elsewhere, I urged, with all the force at my command, the advisability of endeavoring to introduce the natural enemies which

were known to keep it in check in Australia. Certain indigenous species had been discovered preying upon it in California, and I expressed the belief that, as they increased, the fruit-growers would get more and more relief from the Icerya; but I also urged that there was much more chance of success from those which keep it in check in its native home, and which were not imported with it to the countries of its introduction. The case was exceptional, and the attempt thus urged gave every promise of a rich reward. Efforts were made to introduce some of these natural enemies through correspondence, especially with the late F. S. Crawford, of Adelaide, with what ultimate results the subsequent success of Vedalia forever rendered uncertain.

The Hon. H. H. Markham, present governor of California, was at that time a Representative in Congress, and through him chiefly, but also through others, I urged upon Congress the desirability of sending some one to Australia to make a thorough study of the subject with a view of introducing those natural enemies. Again, in the winter of 1887-'88 appeals were made to Congress, not only of a personal nature, but through memorials from various societies in California, for an appropriation to send one or two men to Australia to collect and increase these natural enemies. Congress, however, failed to make any specific appropriation, and also failed to remove the restriction in the appropriation to the Division of Entomology which limited travelling expenses to the United States and prevented independent action of the Department of Agriculture. It happened, however, that about this time an appropriation was made and a commission created to represent the United States at the Melbourne Exposition, and, with the appreciative aid and sympathy of the Hon. Norman J. Colman, Commissioner of Agriculture, I took active steps to gain the co-operation of the Secretary of State in my pet scheme, and by an arrangement with the Department of State, accepted by the commissioner to said Exposition, Hon. Frank McCoppin, the Department of Agriculture was finally enabled to send to Australia two agents of the Division of Entomology, one of them to be under my instructions, and the expenses of both, within the sum of $2,000, to be paid out of the appropriation for the aforesaid Exposition.

It was thus that Mr. Albert Koebele, in the fall of 1888, was sent to Australia for this special purpose. The history of Mr. Koebele's efforts has been detailed from time to time in Government publications and in the press, especially that of California. It suffices to state that a number of living enemies, both parasitic and predaceous, were successfully imported, but that one of them, *Vedalia cardinalis*, proved so effective as to throw the others entirely into the shade and render their services really unnecessary. It has, so far, not been known to prey upon any other insect, and it breeds with surprising rapidity, occupying less than thirty days from the laying of the eggs until the adults again appear. These facts account for its exceptionally rapid work, for in point of fact, within a year and a half of its first introduction, it had practically cleared off the Fluted Scale throughout the infested region. The expressions of two well-known people may be quoted here to illustrate the general verdict. Prof. W. A. Henry, director of the Wisconsin Agriculture Experiment Station, who visited California in 1889, reported that the work of Vedalia was "the finest illustration possible of the value of the Department to give the people aid in time of distress. And the distress was very great indeed." Mr. William F. Channing, of Pasadena, son of the eminent Unitarian divine, wrote two years later:

> We owe to the Agricultural Department the rescue of our orange culture by the importation of the Australian ladybird, *Vedalia cardinalis*.
>
> The white scales were increasing our orange trees with a hideous luxury. They spread with wonderful rapidity and would have made citrus growth on the whole North American continent impossible within a few years. It took the Vedalia, where introduced, only a few weeks absolutely to clean out the white scale. The deliverance was more like a miracle than anything I have ever seen. In the spring of 1888 I had abandoned my young Washington navel orange trees as irrecoverable. These same trees bore from two to three boxes of oranges apiece at the end of the season in winter and spring of 1890. The consequence of the deliverance is that many hundreds of thousands of orange trees (navels almost exclusively) have been set out in southern California this last spring.

In other words, the victory over the scale was complete and will practically remain so. The history of the introduction of this pest, its spread for upwards of twenty years, and the discouragement which resulted, the numerous experiments which were made to overcome the insect, and its final reduction to unimportant numbers by means of an

apparently insignificant little beetle imported for the purpose from Australia will always remain one of the most interesting stories in the records of practical entomology.

The Vedalia has since been successfully colonized at the Cape of Good Hope and in Egypt, and has produced the same results in each case. In Egypt the Vedalia was introduced to prey upon an allied species of Icerya (*I. ægyptiacum*, Douglas). We hope soon to be able to send the same insect to India, where it has recently transpired that *Icerya ægyptiacum* occurs, while recent information received from Phra Suriya, royal commissioner of Siam at Chicago, would indicate that its introduction into Siam for the same or a closely allied insect will be desirable in the near future.

In fact, the success of the experiment was so striking and so important, and resulted in the saving to California of an industry of so great a money value, that it has given rise, not only in the popular mind but in the minds of a certain class of entomologists also, to the idea that remedial work against injurious insects should be concentrated upon this one line of action, and that our best hope for their destruction lies with the parasitic and predaceous species, not to mention fungus and bacterial diseases. From an extreme of comparative incredulity the farmer and fruit-grower have gone, perhaps, to the other extreme of too great faith. The case of Icerya and Vedalia, as I have frequently pointed out, was exceptional and one which can not easily be repeated.

One of the humorous phases of the Vedalia experiment is, that the wide newspaper circulation of the facts—not always most accurately set forth—has brought me communications from all parts of the world asking for supplies of the renowned little Ladybird for use against injurious insects of every kind and description, the inquiries being made, of course, under a misapprehension of the facts.

While this California experience thus affords one of the most striking illustrations of what may be accomplished under exceptional circumstances by the second method of utilizing beneficial insects, we can hardly expect to succeed in accomplishing much good in this direction without a full knowledge of all the ascertainable facts in the case and a due appreciation of the profounder laws of nature, and particularly of the interrelations of organisms. Year in and year out, with the conditions of life unchanged by man's actions, the relations between the plant-feeder and the predaceous and parasitic species of its own class remain substantially the same, whatever the fluctuations between them for any given year! This is a necessary result in the economy of nature; for the ascendency of one or the other of the opposing forces involves a corresponding fluctuation on the decreasing side, and there is a necessary relation between the plant-feeder and its enemies which, normally, must be to the slight advantage of the former and only exceptionally to the great advantage of the latter.

This law is recognized by all close students of nature, and has often been illustrated and insisted upon by entomologists in particular, as the most graphic exemplifications of it occur in insect life, in which fecundity is such that the balance is regained with marvellous rapidity, even after approximate annihilation of any particular species. But it is doubtful whether another equally logical deduction from the prevalence of this law has been sufficiently recognized by us, and this is, that our artificial insecticide methods have little or no effect upon the multiplication of an injurious species, except for the particular occasion which calls them forth, and that occasions often arise when it were wiser to refrain from the use of such insecticides and to leave the field to the parasitic and predaceous forms.

It is generally when a particular injurious insect has reached the zenith of its increase and has accomplished its greatest harm that the farmer is led to bestir himself to suppress it, and yet it is equally true that it is just at this time that nature is about to relieve him in striking the balance by checks which are violent and effective in proportion to the exceptional increase of and consequent exceptional injury done by the injurious species. Now the insecticide method of routing this last, under such circumstances, too often involves, also, the destruction of the parasitic and predaceous species, and does more harm than good. This is particularly true of those of our Coccidæ and Aphididæ and those of our Lepidopterous larvæ which have numerous natural enemies of their own class; and it not only emphasizes the importance of preventive measures, which we are all agreed to urge for other cogent reasons, and which do not to the same extent destroy the parasites,

but it affords another explanation of the reason why the fight with insecticides must be kept up year after year, and has little cumulative value.

But the problem of the wise encouragement and employment of the natural enemies of injurious insects in their own class is yet more complicated. The general laws governing the interaction of organisms are such that we can only in very exceptional cases derive benefit by interference with them. The indigenous enemies of an indigenous phytophagous species will, *cæteris paribus*, be better qualified to keep it in check than some newly introduced competitor from a foreign country, and the peculiar circumstances must decide in each case the advisability of the introduction. The multiplication of the foreigner will too often involve the decrease of some indigene. If a certain phytophage is generally disastrous in one section and innocuous in another by virtue of some particular enemy it will be safe to transfer and encourage such enemy, and this is particularly true when the phytophage is a foreigner and has been brought over without the enemy, which subdues it in its native home. Icerya had some enemies in California, presumably American, but they were not equal to the task of subduing it. Vedalia, in the Icerya's native home, Australia, was equal to the task and maintained the same superiority over all others when brought to America. The genus was new to the country and the species had exceptionally advantageous attributes. But there is very little to be hoped from the miscellaneous introduction of predaceous or parasitic insects for the suppression of a phytophage which they do not suppress in their native home or in the country from which they are brought.

The results of the introduction by Mr. A. D. Hopkins of *Clerus formicarius* to contend with the Scolytids which were ruining the West Virginia pines were doubtful, for the reason that indigenous species of the genus were already at work in America. Yet the experiment was safe and desirable, because the European Clerus is more active and more seemingly effective than our indigenes. The Gypsy Moth was evidently introduced into Massachusetts without its European natural enemies, and as in some parts of Europe it is often locally checked by such natural enemies, a great number of which are known, a proper study of them and the introduction of the most effective could result in no possible harm and might be productive of lasting good. Such a course was advised by me at a conference upon the subject held in the rooms of the State Board of Agriculture, Boston, March 4, 1891,* and in correspondence with the Secretary of the Board. In neither of these cases should we expect the predaceous or parasitic forms to subdue their hosts more effectually in America than they do in Europe, except in so far as they were relieved, in the introduction into America, of whatever enemies they possessed in their native home.

There are two other laws which it is worth while to consider in this connection. One is, that while a plant-feeder's natural enemies are apt to cause its excessive abundance to be followed by a corresponding decrease, yet this alternation of excessive abundance and excessive scarcity will often be produced irrespective of such natural checks. An injurious insect which has been on the destructive march for a period of years will often come to a sudden halt, and a period of relative, and sometimes complete, immunity from injury will follow. This may result from climatic conditions, but more often it is a consequence of disease, debility, and want of proper nutrition, which are necessary corollaries of undue multiplication. Frequently, therefore, it may be inaccurate and misleading to attribute the disappearance of a particular injurious species to some parasitic or predaceous species which has been let loose upon it, and nothing but the most accurate observation will determine the truth in such cases. The past year furnished a very graphic illustration in point. Throughout Virginia and West Virginia, where the spruce pines have for some years suffered so severely from the destructive work of *Dendroctonus frontalis*, not a single living specimen of the beetle has been found during the present year. This has been observed by every one who has investigated the subject, and particularly by several correspondents who have written to me; by Mr. E. A. Schwarz who was commissioned to investigate the facts, and by Mr. Hopkins, who has made the study of the subject a specialty.

*Insect Life, iii., p. 393, ff.

The clearest explanation of this sudden change is that the species was practically killed out by the exceptionally severe cold of last winter, since such was the case with several other insects. Now, following so closely on the introduction by Mr. Hopkins of *Clerus formicarius*, how easy it would have been to attribute the sudden decrease to the work of the introduced Clerus, had not the decrease been so general and extensive as absolutely to preclude any such possibility. In like manner a certain scale insect (*Aspidiotus tenebricosus*) had become exceedingly destructive to the soft maples in the city of Washington last year, whereas the present year it is almost entirely killed off, evidently by the same exceptional cold. Many of the affected trees were painted with whitewash, with a view of destroying the Aspidiotus, and the death of this last might have been attributed to the treatment (and naturally would be by those employing it) were it not that the same result was equally noticeable on the trees not treated. Reports from southern California would indicate that the Red Scale (*Aspidiotus aurantii*) is, in many orchards, losing its destructiveness through agencies other than its insect enemies, and in this case the facts are particularly interesting because of the ease with which its disappearance may be attributed to some of the recent introductions from Australia.

The other law that is worth considering in this connection is that experience has shown that, as a rule, the animals and plants of what is known as the Old World—*i.e.*, of Europe and Asia—when introduced into North America have shown a greater power of multiplication than the indigenous species, and in a large number of instances have taken the place of the native forms, which have not been able to compete with them in the struggle for existence. The converse proposition holds equally true, viz, that our species when taken to Europe, do not hold their own against the European indigenes. This is still more true of the species introduced from the Old World, as well as from America, into Australia, where the advantage of the introduced forms, as compared with the indigenous, has been in many cases still more marked. All other things being equal, therefore, we should expect the species which are beneficial in Australia to be less so when brought to this country, a deduction which brings out still more clearly the exceptional nature of the case of Vedalia and Icerya, just as there are some notable exceptions, as in the case of the Grape Phylloxera, in the introductions between Europe and America.

There are some instances in which there can be no doubt whatever as to the good which would flow from the introduction of beneficial species, and an illustration is afforded in the Capri-fig insect, *Blastophaga psenes*. There can be no question as to the good which would result from the introduction of this species from Smyrna into those sections of California where the Smyrna fig is grown without its intervention, and there are other similar instances which promise well and involve no risk. But I have said enough to show that the successful utilization of beneficial insects is by no means a simple matter and that discriminating knowledge is required to insure success, especially in the second category dealt with in this paper. Wherever the importance of the matter leads to legislation what are denominated "political" methods are apt either to control or in some way influence the resulting efforts—too often with unfortunate consequences. We should, as economic entomologists, be on the alert for special cases where the introduction or dissemination of beneficial species promises good results, and do our best to encourage an intelligent public appreciation of such special cases, while discouraging all that is of a sensational nature, as likely to mislead and ultimately do our profession more harm than good.

THE ECONOMIC VALUE OF PARASITES AND PREDACEOUS INSECTS.

By John B. Smith, Sc.D., New Brunswick, N.J.

At the very outset I wish to disclaim all intention either of producing a treatise on parasitism in general or disputing the importance of parasites in nature. No one can realize more than I do how much parasites maintain the balance and check the increase of injurious species. I am perfectly aware that were it not for parasites many an insect would become so abundant that certain crops could not be satisfactorily grown. Fully realizing, therefore, the place and importance of these parasites, I feel at the same time

that their economic value has been grossly over-estimated: in fact I am almost ready to say that parasites have no real economic value to the agriculturist. This sounds like a very radical statement, and perhaps I do not mean it in the fullest sense of the terms that I have used, but I would not much modify the sense of the language. The "life history" of an insect is incomplete until we know not only how it lives and upon what it feeds, how it transforms, and the duration of its various stages, but also what species prey upon it, and to which it furnishes sustenance in one or the other of its stages. We are therefore right in our studies of the "life history" of injurious insects in studying also the parasites that prey upon them. We are right also in publishing the results of our work, including the descriptions of the parasites. We are right in calling the attention of the farmer to the fact that the injurious species are very largely kept in check by either parasites or by predaceous insects; but we are wrong in leading him to suppose that either parasites or predaceous insects will control the injurious species for him. Yet the tendency of the language used in many cases by entomologists, and more often by those who are not entomologists, has suggested the possibility that injurious species may be controlled by either parasites or natural enemies without very much work on the part of the farmer. The impression is current that it will be possible to use natural means to exterminate injurious insects, and I have been asked frequently during the past two years, by farmers who may be considered as fully equal in intelligence to the best in the land, those who read and usually understand, why I did not make some effort to cultivate or import parasites or natural enemies of our common injurious insects. Of course these questions all grow out of the remarkably successful experiment made by Dr. Riley in the importation of the Australian *Vedalia cardinalis* to exterminate the imported *Icerya purchasi*, and I have decided to bring up this subject for discussion at the present meeting in order that possibly a little more definite light can be obtained upon the exact place of parasites and predaceous insects in economic entomology. It needs no argument on my part to prove that nature never creates organisms merely to destroy others that she had previously created. Parasites do not exterminate their hosts in any instance; their mission is merely to interpose a check to undue increase, and it is natural that this should be so, for were the host destroyed the parasite itself would perish, unless it were able to change its food and prey upon other species. It is by no means improbable that in the past certain species have been exterminated by their parasites, and, indeed, it is very probable that some such cases are in progress now. Many lepidopterous larvæ are rarely found free from parasites, and the adults are among the rarest of our species. Here we have instances where the parasite very materially lessens the number of the host and allows each year only a very few specimens to escape. It is only through the fecundity of the species that it is enabled to maintain itself at all. These cases are exceptional. Usually the relation of the parasite to its host is more moderate. Excessive increase is checked, but excessive increase only. There is always a very large proportion of larvæ and usually a comparatively small proportion of parasites. Nature tends to preserve a balance among her creatures, and a balance only. Many species which are much subject to parasites are abundant each year, and remain equally abundant from year to year, varying only very slightly, and these variations are rarely the result of an excessive increase of parasites. Nature also works very slowly, and she adapts insects as well as other animals to their environment only by means that require ages for their completion. Insects that are confined to plants which, under natural conditions are not common, need few parasites to keep them in check. The great difficulty in finding food is in itself a sufficient check, and parasites are not necessary, indeed they could not be supported under the circumstances. If, by any unnatural condition introduced by man, the supply of food for this otherwise rare insect is suddenly increased, it obtains the possibility of multiplying rapidly, while the number of parasites do not increase proportionally. In the course of time nature may make a change and other species may attack this form which has now increased abnormally; but this is something that the farmer can not wait for; he must have some means of dealing with the insect at once, and he must leave the operations of nature to benefit his descendants. The spread and increase of the potato beetle, *Doryphora 10-lineata*, is a case in point. Here neither parasites nor natural enemies assist the farmer in any noticeable way. He must depend upon his

own exertions to save his crop. There are however, many insects which are very commonly parasitized, and among them may be mentioned the various species of cutworms. It is nothing uncommon to find in an infested field that fully one-half, and sometimes as many as three-quarters, of the specimens will have eggs of the Tachina flies attached to the skin, and probably others have parasites which are not externally visible. Yet the fact that these cutworms are infested by parasites is of absolutely no value to the farmer. They eat just as much as if they were not parasitized, and it is really a matter of little importance to the agriculturist whether the food that is stolen from him makes a moth or a fly. The caterpillar feeds all the same until it is full grown. Next year in the same field there will just as many cutworms as there were in the previous year. The parasites have kept the number within the same limit, and the farmer has not been benefitted. If he desires to save his crop he must himself adopt measures for the destruction of these insects; parasites will not help him in the least. Let us take another instance: One of the species of Tortricids infesting the Cranberries is very subject to the attacks of parasites, two species being abundant and a third rare; yet every year the bogs suffer equally from this species. If we collect a large lot of larvæ in the early spring, we will find that very few of them will give out parasites. From the second brood we will breed a great many more, while of the third and last brood, probably seventy-five per cent. will prove to be infested by parasites. This sounds very pretty, indeed, and we say that the insect has been controlled by its parasites, and so it has; but not until it has ravaged the bogs, and has done all the injury that it could do. It has destroyed the crop, and seeing the enormous increase of the parasites during the year, the natural conclusion is, that they will next spring still further reduce the number of their host and bring matters to such a state that little or no further injury is to be apprehended. Yet, as a matter of fact, nothing of the kind occurs. We find that somehow during the winter the mortality among the parasites has been very much greater than it has been among the moths, and that just as in the previous year the first brood of moths will be almost exempt from the attacks of the parasites. We will have on the bogs exactly the same history that we found in the previous year. Of what practical benefit is this parasite to the farmer? It does not do anything in the world to prevent the destruction of his crop, nor does it any way lessen the damage, for where these insects occur and are allowed to increase without check, except by their natural enemies, they appear in sufficient numbers each year to take the entire crop. This is not a solitary instance. It can be matched with ease in all our common insects. The Codling Moth, for instance, has parasites, and is doubtless kept in some check by them; yet every one present knows that if parasites and natural enemies alone were depended upon, farmers could not count on a single perfect apple. They do check the excessive increase of the insect, but they do not lessen in the least the number that can be supported by the food plants. All the parasites that have been described from the Codling Moth, from the Plum Curculio, and any others of our injurious insects do not benefit the farmer one dollar in the value of his crops, and I think it is well that this should be generally understood, because of the tendency that I have already mentioned to expect too much from the parasites. It must be remembered also that in the operation of preserving the proper balance between life of all descriptions, nature itself has intervened to prevent the undue increase of the parasites, either by making them less fertile than the hosts upon which they prey, by giving them a smaller number of broods, or by supplying them in turn with parasites which keep them in check. This secondary parasitism is well known and it is as effective in preventing the excessive increase of the primary parasites as these are in preventing the excessive increase of the original host. There is really almost as much danger, and that is very little, that the secondary parasites will destroy the primary parasite as that the primaries will exterminate their host. Predaceous insects are in much the same case, they never entirely destroy the species they feed upon, and in 99 cases out of 100 they conquer their prey after all the injury has been done to the growing crops. Let us take the case of the Melon Louse for example. This makes its appearance in June or July, and increases with marvellous rapidity. Very soon after various species of Coccinellids make their appearance and begin preying upon the plant louse; but in the number in which they first appear they are incapable of eating up the lice as fast as they multiply. By Sep-

tember they are up with their prey, but then it is too late; the crop has been destroyed, and although it is quite probable that the late broods have entirely rid the vines of plant lice, yet it has not benefitted the farmer one solitary cent. I had a beautiful opportunity of observing this in 1892. It was a pleasure to see how the late broods moved from vine to vine, leaving scarcely a living louse behind them; but that same vine was dried and withered; whatever fruit there remained on it was undersized, blackened by honey-dew, half ripe, and never in fit condition for market. Acre after acre I have seen in just that condition, and practically no revenue has been derived from the land. It is quite true that the beetles exterminated or nearly exterminated the plant lice, but this did not advantage the farmer one solitary cent. A few buckets of kerosene emulsion liberally applied early in the season, while the plant lice were running away from the lady-birds, would have been of a great deal more money benefit than all the aid that nature gave. My contention is, that in dealing with injurious insects from the farmer's standpoint, we can entirely ignore the work of parasites or predaceous insects. We must accept the fact that each year these insects will appear in about the same numbers; that nature has evidently assumed that this is about the proper number to appear, and that all her checks are arranged accordingly. If we wish to lessen them, we must do it by means other than those which she has provided.

There is, of course, a possibility that we may in some cases make use of either parasites or predaceous insects. That has been very well illustrated by the instance before referred to, that of the Vedalia and the Icerya. The one point that is overlooked by the majority of those who see only newspaper accounts is, that we had to deal in the first place with an insect which was not a native, but which was imported. In the second place the insect preying upon it was also imported, and found as the only familiar form upon which it has been used to feed just this one species. In bringing over the Vedalia, its natural checks were not brought with it, and in liberating it in the orange groves of California, it was given an advantage that it could never have possessed in its own country. There may be a few of our insects in a somewhat similar position, and possibly some one of us may yet be as successful as Dr. Riley was in reference to some other permanently injurious species. It may even be that parasites which in their native home are not able to control or exterminate the species upon which they prey, may when introduced into this country, have such an advantage that they will accomplish more than they could in their native home. I say this may be so, but I do not anticipate it in many cases. Insects are very slow to change their habits. Just as it is rare for an American parasite to attack an imported insect in any numbers, just so rarely will we be able to induce a European or other foreign parasite to attack the American insects. We have a field here which is comparatively new, and of which we know very little, but it is not that particular field that it is my intention to enter. The propositions that I do make, and that I am ready to defend are: Among our native insects parasites act merely as a check to excessive increase. Excessive increase means more than the natural food of the insect is able to support, and does not mean excessive increase in the sense of the farmer. An insect that is, under natural conditions, abundant each year, must be dealt with without any regard to parasites or natural enemies. Other than I have just suggested, parasites and predaceous insects have absolutely no economic value.

INSECT FOES OF AMERICAN CEREAL GRAINS, WITH MEASURES FOR THEIR PREVENTION OR DESTRUCTION.

By F. M. Webster, Wooster, Ohio.

The three principal cereal grains of America north of Mexico, viz., maize, wheat and oats, cover an approximate area of from 140,000,000 to 150,000,000 acres. In other words, the natural flora over this vast territory, comprising a great variety of species, has been largely exterminated, and, instead, but three have been substituted, all of which are annuals with a capacity for reproducing each year from twenty to two thousand fold. As nature is said to abhor a vacuum, so does she resent a monopoly, except it be in cases where but few species can exist, and the increase of the individuals of these are ultimately restricted by other influences, such as a rigorous climate or a barren soil. Our grain fields include neither the barren desert, the frozen mountain tops nor the ice-clad regions of the far north, but the fertile prairies and valleys over which vegetation naturally grows in great luxuriance and profusion, each species, if left to itself, being kept in its proper numerical sphere by natural laws. The agriculturist, however, comes upon the scene and incites an insurrection, causing the three species before mentioned to not only rebel, but overrun and take possession of these broad acres, putting the original inhabitants to death and establishing themselves in nearly or quite full power. If the contest were wholly a natural one, the interlopers would soon be forced into their proper places, and exist only in proportion as they could resist the returning encroachments of the natural flora. But the plow and the hoe again interpose, and the victors still hold the field. Nature then does what is naught but good generalship, brings up her reserves in the animal and vegetable enemies of the three usurping species and precipitates them upon the foe. It is here that the hand of the husbandman seems to lose its cunning. He can fight the forests, the weeds and the grasses, but when it comes to warring upon the insects and fungoid enemies of his grains he seems to lose heart. His reserve force is, or at least should be, in his superior knowledge; but too often this virtue seems to be either sadly aborted or entirely wanting. He does not study ways to destroy or circumvent these enemies of his crops, but, on the whole, allows them to go their way, patiently taking what they leave and hoping for better luck another year.

It is here that I wish to take up my subject and show how many of the insect foes may be either destroyed or prevented from inflicting serious injury. The field of applied entomology is not the science of killing insects, alone, but includes also the warding off of their attacks. For my own part I would reverse these terms, as it seems to me that the evasion of an attack is ordinarily the most important. I would put it in this way: Warding off the attacks of injurious species by preventing their breeding, and, in case this is not practical, destroying them either before or after the attack had begun. And I may be allowed to here make use of an oft-quoted adage, "An ounce of prevention is better than a pound of cure."

There are upwards of 140 species of insects affecting these three grain crops, and maize alone has over 100 insect foes, a number of course depredating alike upon all three. Of these, such as infest the stored grain excepted, there are very few whose attacks can not be far more easily warded off than remedied after they have begun. I know of no better insecticide than good farming, After eight years of study of the Hessian-fly (*Cecidomyia destructor*) I am satisfied that four-fifths of its injuries may be prevented by a better system of agriculture. For years I have seen wheat grown on one side of a division fence without the loss of a bushel by attack of this pest, while on the other side the crop was almost invariably more or less injured. No effect of climate, meteorological conditions, or natural enemies could have brought about such a contrast of results. The whole secret was in the management of the soil and the seeding. In fact, the question of success in evading the pest, in the one case, did not appear to be an entomological one at all; and I am fully convinced that the Hessian-fly problem, so far as it relates to agriculture, throughout that portion of the country lying between the Alleghany Mountains and the Mississippi River, and between the Ohio River and the Great Lakes, may be considered practically solved.

Heretofore we have told people that the fly could not exist except where fall wheat was grown. But this can be said no longer, as the pest occurs in North Dakota and in a locality where fall wheat is never sown. As the fall brood of flies emerges continually earlier as we go northward, it seems to me that we must eventually reach a point where it will cease to appear in autumn at all, and go over until spring, a state of affairs that will easily account for the breeding in spring wheat in North Dakota. In other words, I expect to find that nature has protected the species alike from the protracted northern winter, and the equally prolonged southern summer, by varying its resting season with the latitude, and, possibly, also with its proximity to the seacoast. That is, we shall find the insect passing both the hot and cold seasons largely in the flaxseed stage, that being the stage of development during which it is best protected from the elements and the lack of food.

There are several good reasons why we might expect the fall brood to become extinct to the north, while the spring brood continues, the principal one being that there is not sufficient time for the former to develop before the cold season begins. Besides, in the continuity of the species it can best be spared, and I understand that it is not present in England. In nearly all cases where a species is two-brooded, the spring-appearing brood of adults is the producing while the fall is the diffusing brood. The spring-appearing flies are loth to leave the field in which they originated, and prefer to oviposit on the tillers of the wheat plant, while the autumn-appearing adults will spread out everywhere over the country, and will, seemingly, scent out a field of wheat at long distances. They can even be drawn to very small plots in the midst of large cities. With the Aphides the winged female produces fewer young, but spreads them over a larger area. In *Isosoma tritici* the spring brood of females has so far followed this rule in the past that their wings are either entirely absent or aborted, while the summer brood, *grande*, has invariably fully developed wings and is the diffusing brood. The Army Worm, *Leucania unipuncta*, is destructive through one brood only, the fall brood being far less gregarious. This is also true of the Chinch Bug, *Blissus leucopterus*, though in Northern Indiana and Northern Ohio I find the larger parts of the adults with aborted wings. The spring brood of Hessian Fly, coming as it does from plants that will continue through a sufficient season for their progeny to develop, has no need to migrate, while those that summer in the stubble must necessarily change, as the plants can furnish no further nourishment; besides, diffusion and differentiation serve in a measure, to protect from natural enemies. But, notwithstanding this, it will be easily observed that the latter brood can be best dispensed with without material and permanent injury to the species. This appears to me to be the state of affairs that we may look for. I do not wish to be understood as making the unqualified statement that these conditions do exist, and only hope that members of this association, located to the north and to the south of the area indicated, will be able to prove either the truth or fallacy of my position. We have much yet to learn in regard to this Hessian fly, and a study of it in any locality would probably develop some new features, or at least new parasites.

There are some facts connected with the two species of Isosoma, *I. tritici* and *I. hordei*, that, to me at least, are rather puzzling. Unless an undermined species, found in New York by Dr. Lintner, proves to be *tritici*, I am not aware of its occurring east of the Alleghany Mountains, though it reaches west to the Pacific coast. On the other hand I never saw *hordei* in Illinois or Indiana, nor did I find them in central Ohio, yet I had not been a week in the northern part of the latter State before I found them in abundance. They occur, generally, over the north portion of the State and into Michigan. Is it not possible that *hordei* is of northern origin, where the season is too short for two broods, while *tritici* has pushed up from the south, where the protracted vernal season is favorable for the development of two broods? I find that the *hordei* almost invariably selects small wheat plants in which to oviposit, while the summer brood of *tritici* as invariably selects large, thrifty stalks, usually where the plants are thin on the ground but rank growing. In northern Ohio I never find *hordei* far below the upper joint, an exceptional feature I believe, though it seems to me we might look for such a state of affairs, as it oviposits during a season intervening between the spring and summer broods

of *tritici*. Then, too, I notice the parasites of *hordei*, at least *Eupelmus allynii*, French, *Semiotellus chalcidiphagus*, Walsh, and *Websterellus tritici*, Ashmead, emerge in August and oviposit in the same straws from which they themselves emerged, the adults from these emerging in spring. I have also noted the same thing in the two former species where their host was the Hessian Fly. In both cases, however, I got fewer parasites in spring than in August.

So far as measures for their control are concerned, *tritici* can be largely overcome by a rotation of crop, while both this and *hordei* will be destroyed by burning the stubble, a measure equally applicable to the Hessian Fly and Wheat Stem-maggot, *Meromyza americana*. In some portions of the country, however, clover is sown among the young wheat in early spring, and a burning over in summer under such conditions is impracticable.

I wish to call attention to a few points in reference to the Chinch Bug, *Blissus leucopterus*. The area of extreme continued injury by this pest covers southern Minnesota, southeast South Dakota, much of Nebraska and Kansas, all of Iowa, and much of Missouri, Illinois, all of Indiana except northeastern portion, extreme southwest Ohio, and northern Kentucky, though in the wheat region of the Mississippi Valley the pest is by no means limited to this area, nor does it confine itself to the wheat region at all.

They are more abundant in Louisiana, where wheat is never cultivated, than they are in northern Ohio, where this cereal is one-half of the grain crop. When they were working their greatest havoc in southern and central Illinois and southwest Indiana I looked in vain for them in northern Indiana. I do not understand why it is that a very large per cent. of the adults found in Ohio, along Lake Erie, and in northern Indiana possess only aborted wings; yet I have found this to be the case. As you all know, the insect parasites of this species are very few and of little account in holding it in check. For aid in this direction we must look to the meteorological conditions unfavorable to their increase and fungoid and bacterial parasites. These last will be found available during some seasons and within a certain limit, but nature is not likely to use one of her servants to annihilate another. We may be able to emphasize their work in this direction by continual artificial cultivation and distribution: further than this we can not expect to go, and the relief will at best be but local and temporary, though not by any means without value in limited areas. The only difficulty is that we, with certainty, can not foretell a year of destructive abundance, and a few false alarms will so discourage the ordinary farmer that he will do nothing to protect himself. For my own part I feel quite sure that if the bugs can be induced to oviposit in spring in small plots of Millet or Hungarian grass, they can be controlled by the use of these vegetal diseases to far better purpose than to attempt to do so in the fields of ordinary cultivation. But there must be, somewhere, a central source of supply where requests for material can be promptly filled, as has been done by Prof. Snow, before the plan will prove a success. Next in value to such plats is, I think, the cornfields where the young bugs must of necessity congregate in compact masses and thus facilitate contagion.

It would appear almost visionary to advocate spraying apple orchards in midwinter to protect the wheat crop, but nevertheless one of the most serious enemies of young fall wheat passes its egg stage on the twigs of the Apple during the winter season. I refer to the Apple Leaf-louse, *Aphis mali*, Fab. Soon after the young wheat plants appear in the fall the winged viviparous females of this species flock to the fields and on these give birth to their young, which at once make their way to the roots, where they continue reproduction, sapping the life from the young plants. On very fertile soils this extraction of the sap from the roots has no very serious effect, but where the soil is not rich, and especially if the weather is dry, this constant drain of vitality soon begins to tell on the plants. Though they are seldom killed outright, these infested plants cease to grow, and later take on a sickly look, and not until the Aphis abandons them, in autumn to return to the Apple, do they show any amount of vigor. It is very seldom that the affected plants fully recover, at least in autumn, and the result must be to reduce their productiveness the following year.

The greater number of serious pests of our fields of Indian corn are such as work to their injury below the surface of the ground. The larvæ of Elaters devastate our lowlands and the grubs of Lachnosterna ravage the higher lands, while Cutworms, Web

Worms, and Corn-Root-worms are found generally diffused over both. The Corn-Root-worm, *Diabrotica longicornis*, excepted, all of these seem more destructive to a crop of grain following a grass crop or pasture. Yet this is not always true. I have known of fields of corn being seriously affected by white grubs when such fields had not been devoted to grass for a single season in twenty years.

In the case of Wire Worms some good results may be secured by fall plowing, though as the adults emerge in August or September, and winter over also in this stage, we can hope to do little with these. There are, however, during the winter two young generations in the soil, and against these a fall plowing may and evidently does have an ill effect. What a summer fallow would do I have had no opportunity of learning. There are no end of reported successes and failures among farmers, but there is so much obscurity shrouding these that one cannot judge of their authenticity. Once and once only, have I felt quite sure of having beaten these pests. This was in the case of a field of grass land, plowed in spring and planted with potatoes. The worms nearly ruined the crop, and in the fall the ground was still well populated with them. The following spring potatoes that had escaped notice when the crop was harvested seemed to attract the worms, and the latter were found burrowing in the tubers in great numbers. On my suggestion, hogs were turned into the field, and these rooted out and promptly disposed of both potatoes and worms, no injury occurring to the following crop, which was of corn. There may be some virtue in the application of kainit, although this has not as yet been thoroughly and clearly demonstrated, and, besides, over the vast corn belt of the Northwest, its application is impracticable. For myself, I am willing to confess ignorance of any unfailing, practical measure, either of prevention or destruction. Fall plowing and a rapid rotation of crops are as yet the best measures we can recommend.

White Grubs, the larvæ of several of our species of Lachnosterna, appear to give preference to the higher lands. Where the soil of such lands is of such a nature as to wash easily during winter and spring, fall plowing results in the washing out of great gullies, thus constituting a grave objection to the measure. Outbreaks of this pest seem to be usually of triennial occurrence, different localities being affected during different years, and I have thought we might accomplish something by mapping out these areas, and so warn the agriculturist of their probable appearance. Here, however, the same trouble awaits us. A single mistaken prediction discourages the few who will follow our direction, and we get only derision from the remainder. In my own correspondence I have advocated the same measures against these as in case of the Wire Worms, viz., a rapid rotation of crops, especially of grass or clover, and fall plowing, whenever it can be done without detriment to the fields. What has, or is likely to be accomplished by the use of fungoid parasites, I do not know. The opinion of our presiding officer, who is experimenting in that direction, will be of interest to us all. As in the case of the Corn Root louse, *Aphis maidis*, Fitch, or *Aphis maidiradicis* Forbes, less injury is done in fields that have been fertilized with barnyard manure.

The Corn Root-worm, *Diabrotica longicornis*, Say, has by its ravages cost the farmers of the Mississippi Valley millions of dollars during the last fifteen years, every penny of which might have been saved by a judicious system of husbandry. Every member of this association, located in the infested area, has again and again sounded the alarm and announced the remedy, yet I fear there are some who have not heard it. In Ohio it is unknown, except along the western border of the State. Its occurrence here, where it was reported last year for the first time, raises the question of its eastward diffusion—a problem which I hope to be able to solve. The congener of this species, the Southern Corn Root-worm, *Diabrotica 12-punctata*, Oliv., will certainly not be managed so easily. There is yet some investigation to be done on this species, before we can confidently advise in regard to its destruction. It appears, in the adult stage, to be well nigh omnivorous, and the larvæ travel freely.

The Corn or Boll Worm, *Heliothis armiger*, Hbn., is more especially a Southern species, though as far north as Chicago, there are during some seasons two broods, as, in that portion of Illinois, I have found half grown larvæ in the ears of ripe corn, in November. In the North the damage done is trivial, often being due to the rain and dew running into the affected ears, causing them to decay. Among the market gardeners, where

it works in the sweet corn, the measure suggested by Prof. French, several years ago, which was late plowing in the fall, will do much to hold the species in check. In the South the most sensible and practical suggestion that I have seen mentioned is to plant corn early among the cotton in order to attract the early brood of worms, and then destroy the corn in a way to kill the depredators.

For the major portion of the cutworms, I have much faith in laying down of poisoned grass or clover baits, but the larvæ of *Hadena devastatrix*, Brace, and H. *stipata*, Morris, can not be reached in this manner, as they do not come to the surface to feed. The first eats the plants directly off a short distance above the roots, while the last eats into the stem at about the same place, then tunnels its way upward, eating out the heart after the manner of the Stalk Borer, *Hydrœcia nitela*, Gn.

I have here to introduce a third species of Hadena, *H. fractilinea*, Grt., and an entirely new depredator in our cornfields, at least so far as published records are concerned. In fact we rarely find the species mentioned at all in our entomological literature. The imago was described in the *Canadian Entomologist* (vol. VI, p. 15, January, 1874), the habitat there being given as Canada (Petit), Albany, N. Y., (Lintner). Prof. G. H. French, who first determined the species for me, has it from Maine and New York, and Prof. John B. Smith has it from Maine to Ohio, Minnesota to Colorado. How far south it extends I do not know. The adults are so exceedingly quick in movement and secluded in habit that it is not surprising that it should be overlooked. Several specimens of both sexes that were transferred from the cage in which they were reared to another in which grass was growing were not observed afterwards.

The habits of the larvæ are in strange contrast with those of *stipata*, at least in the cornfields, where that species works entirely below ground, entering the stem just above the roots and eating its way upward, while in this species they climb up the plant and eat downward, devouring the whole interior of the stem down to a point where the *stipata* would begin. If the plant be a young one—that is only 2 or 3 inches in height —these larvæ will enter the cylinder formed by the youngest leaf ; but if the plant be older and tougher they will eat downward along the edges until the tissue is more tender, when they will enter the stem and work downward. The time of oviposition I am unable to give. Larvæ, from two thirds to quite full grown, were taken the last of June, when they were said by farmers to be disappearing. From these larvæ imagoes appeared, *in the insectary*, the last days of July and up to the 10th of August. I did not observe them, nor can I learn of their occurrence elsewhere than on spring-plowed grass land, and this, either wholly or in part, timothy sward. There appeared to be no difference in point of injury between early and late spring plowing. There did not appear to be any disposition on the part of the larvæ to wander about, but if the corn was planted in hills, after finishing one stalk they would abandon it and attack another, and so on until all were destroyed.

The larvæ, from which all of my adults were reared, were taken from corn plants, either in the field or from plants sent me by my correspondents, and I saw every one of them in transferring them to the breeding cages. All were working in corn in precisely the same manner and there was certainly no noticeable difference in the larvæ. The imagoes, however, were those of two species, as they are now understood, the larger number being the one under consideration, while the remainder were *Hadena misera*, Grt. If, therefore, the two species are distinct, then this almost must be added to the list of corn-destroying insects, and a further study will be necessary to separate the larvæ, whose depredations appear not to differ. Prof. Smith writes me that he has this last species from Colorado, taken by Bruce, and also from Minnesota, bred by Prof. Lugger. All this, of course, does not disprove the validity of the species, as, if I remember rightly, there is a strong resemblance between the larvæ of *H. fractilinea* and *H. stipata*, as I observed them in corn in Indiana some years ago.

The various species of web worms, larvæ of several species of Crambus, are, of late, working nearly as much damage in our cornfields as are the cutworms, and are even less accessible. The larvæ of at least three species have this season devastated the cornfields of eastern Ohio, one of which appears to feed below ground exclusively. For my part, I

am puzzled to know how to deal with these. Can it be done by breaking the sod in early summer, and allowing the wind and sun to dry out and kill the grass roots, thus starving the very young worms? The plan of breaking the ground very late in spring and planting the crop immediately I find often fails of protection.

In conclusion, permit me to direct attention to the fact that the field of the economic entomologist is but poorly defined. To work out the life history of a species and study its relations to other forms of life, learn what substances will destroy it, determine what course of procedure is calculated to prevent its breeding, would appear to constitute our true field of labor, but we are expected, by some sort of magical power, to transform ourselves into carpenters, mechanics, or civil engineers, and devise machines, methods, and all the details of application in a manner to fit the current notions of agriculturists.

Now, it seems to me that this is not necessarily all applied entomology. It belongs, it appears to me, equally as much to the science of applied agriculture, and I am in favor of giving the farmer the opportunity of putting his own shoulder to the wheel and exercising some of his own ingenuity to help himself. Outbreaks of the injurious insects, like the diseases of the human system, are due to certain foregoing causes over which the entomologist has no control whatever, but when the trouble comes we are expected to go out and instantly stop it. You all know how impossible this is, and yet how difficult it is to make people understand the impossibility of it. I think that at present we are doing our whole duty and even more.

I congratulate the members of this association on the progress we are making. No nation on earth is making or ever has made such rapid advances. We make some mistakes it is true; who that does anything at all does not? Honest errors are not only no disgrace but may be of value to those who follow after. We are profiting by the mistakes of Harris, Fitch and Walsh; why may not those who shall carry the work forward after we are gone likewise profit by ours?

In discussion, Mr. Howard stated that *Isosoma tritici* occurs outside the limits Mr. Webster assigned it, since it has been found east of the Alleghanies.

Mr. Forbes remarked that it cannot be inferred that the Hessian Fly is single brooded in a region where no winter grain is raised, on the evidence of the absence of winter grain alone, since volunteer spring grain may give opportunity for the breeding of a second generation, and in this connection instanced an observation of his own in the spring wheat region of northern Illinois, where the fly is admittedly double brooded, but where he found it infesting barley in spring.

In reply to questions Mr. Webster stated that a difference in the relative injury by Hessian Fly observed by him in two fields was due to the better condition in which the ground was kept in the case of one of them, so that wheat sown late enough to escape the fall attack grew rapidly and went into the winter in prime condition, while in the other field the wheat, if early sown, was infested, and, if sown late, was winter killed.

Mr. Webster stated in this connection that the fall brood of the fly scatters everywhere for oviposition, while the spring brood does not range widely, but is most likely to lay again on other plants (suckers, etc.) in the same field.

Mr. Riley asked Mr. Webster to give some account of the actual experiments and observations which had led him to make the statement in reference to the Apple Aphis (*Aphis mali*). He had for a number of years known that this species had a summer existence on various grasses, and had been very anxious to have Mr. Webster, while an agent of the Division of Entomology, follow the full annual cycle of development so far as the wheat plant was concerned.

Mr. Webster said that he felt that his experiments were sufficiently conclusive.

The fourth session was held on the morning of August 16. The Committee on the President's Address reported in favor of the adoption of his recommendations, and the appointment of a standing committee to present a detailed plan for co-operative work among members and to make recommendations concerning legislation. The report was adopted and Messrs. Osborn, Smith and Garman were appointed a committee.

FUMIGATION WITH BISULPHIDE OF CARBON FOR THE COMPLETE AND RAPID DESTRUCTION OF THE INSECTS WHICH ATTACK HERBARIUM SPECIMENS, FURS, WOOLLENS, ETC.

By H. du Buysson, Brout Vernet, France.

The fumigating chest for use with bisulphide of carbon has been employed for many years in the preservation of unpoisoned herbaria, which would infallibly be devoured without this annual or biennial precaution. These fumigations may render great service in the preservation of other objects more useful than the specimens of a herbarium. I shall describe, therefore, the first method used, and every one will know how to apply it to his own needs.

Description of Fumigating Chest.

It is in principle a rectangular box of light wood, lined with thin zinc, which is carefully soldered at all joints. Around the edge of the box, inside, runs a little gutter of zinc, carefully soldered. This gutter is filled with water and serves to make a water seal by means of the flange of the lid, which is also covered with zinc and carries all around a strip of the metal bent at right angles, and long enough to plunge into the water in the gutter. In this way the box is hermetically sealed and the vapors of the bisulphide cannot possibly escape from it.

Use in the Preservation of Herbaria.

Botanists now generally poison their specimens, and the fumigating box is seldom used. Nevertheless it has served me well and I still resort to it from time to time, to preserve such plants as I have not time to submit to the action of arsenic in alcohol or to bichloride of mercury.

The process in question is based upon the great volatility of bisulphide of carbon at ordinary pressure and moderate temperature. The penetration of its vapor is so considerable that we have only to pile up in the chest the mounting sheets of the herbarium, one above the other, in order to fumigate them. They are penetrated to the very centre, and eggs, larvæ, and perfect insects, Anobium or Attagenus, are killed. Space should be left and right of the pile for the vessels containing the bisulphide. Those which I use are of zinc and measure 10cm. long, 6cm. wide, and 9cm. deep. There is no risk in prolonging the fumigation; on the contrary there is but the greater certainty of its being efficacious. Five or six days will be time enough. No limit need be set to the quantity of bisulphide used; what is not evaporated will serve for a new charge.

The disagreeable odour of bisulphide of carbon is not persistent; it is not even necessary to spread open the mounting sheets; it is only necessary to expose them, unopened, to the air. I would call attention, however, to one very necessary precaution, if accidents are to be avoided. The vapor of bisulphide is very inflammable, and the chest must, therefore, be set in a safe place and not opened near a fire or any flame whatever. It would be risky, for example, to unpack the chest in the evening while holding a lamp in the hand.

As the odor of bisulphide is very disagreeable and may cause discomfort to some persons, all these operations should be performed in an attic or in an apartment of which the windows may be left open as long as necessary.

Preservation of Furs and Woollens.

The same process may be used in the preservation of clothing in clothing establishments, civil or military, where Tinea and Attagenus sometimes cause such ravages. Special arrangements may be adopted in establishing fumigating chests or rooms to avoid the settling due to weight and to facilitate the penetration of the gas.

This method makes it certain that we shall not "shut the wolf up in the sheepfold." Articles fumigated are entirely rid of eggs, larvæ, and living insects. They may be shaken out in the open air for greater security and then replaced on the shelves, with the assurance that they will not be found gnawed when next visited.

Preservation of the Stuffing of Furniture and Saddles.

Tinea and Attagenus have a marked predilection for horsehair, so that these insects are sometimes found flourishing in the stuffing of our furniture, even that which is in daily use. This process has the advantage of permitting us to destroy them without having recourse to the upholsterer; we need but to construct a fumigating chest large enough to contain a couple of armchairs or more. In the same way we may treat mattresses, eider-down quilts, or anything which is supposed to contain eggs or larvæ.

I have experimented with a saddle much damaged by moths, and after fumigating it five days noticed no appearance of insects; the saddle was completely penetrated by the vapor and all the moths perished. I kept it two years under observation in order to be assured of the efficacy of the process.

Disinfection in Epidemics.

I am persuaded that clothing subjected to this process would be disinfected quite as well as by the processes usually employed in certain epidemics, such as typhus, cholera, smallpox, etc. It seems to me that the vapors which penetrate fabrics so well and kill insects so thoroughly would act in the same way upon the microbes which engender epidemics *

In discussing this paper Mr. Atkinson stated that he had used a very similar box in fumigating objects infested with insects.

Mr. Garman called attention to the fact that at the museum of comparative zoology at Cambridge, a large upright zinc lined case was constantly used for disinfecting the skins of birds and mammals.

Mr. Riley had used bisulphide of carbon successfully for his insect collections.

Mr. Smith had used it successfully for ants, and found it not injurious to vegetation.

Mr. Garman reported having found it effective in destroying the Melon Louse. His method of applying it was to roll the vines up in a heap, then invert a tub over them, and after placing a saucer containing a tablespoonful of the bisulphide under the tub, its edges were pressed down into the soil or the earth was drawn up when necessary. He had tried the fumes of burning sulphur and tobacco, but the former injured the plants and the latter did not kill the plant lice, many of them gradually recovering after being stupefied by it.

Mr. Smith thought since the aphides often spread from particular plants or hills, the use of bisulphide in good season might make it possible to prevent the injuries of these insects.

Mr. Atkinson read a paper by Dr. J. Ritzema, Bos., on "Aphelenchus olesistus, nov. sp., a nematoid Worm, causing Leaf sickness on Begonia and Asplenium." He referred to a note by Mr. Atkinson read at the preceding meeting of the Association, in which an Anguillulid is described as affecting leaves of Chrysanthemum and Coleus, making no swelling or deformity, but causing brown patches on the leaves. The author having studied and described *Aphelenchus olesistus* in Europe, where it causes almost precisely the same trouble with Begonia and Asplenium, is inclined to think that the species previously mentioned by Mr. Atkinson is identical. In the discussion Mr. Atkinson stated that while there were characters in the form studied by him which seemed to place it in the genus Tylenchus, he thought that careful comparison of types might show the two to be identical.

*Note.—I have observed in a number of cases a very decided power of taking out the colors of fabrics which I have submitted to its vapor. It may, therefore, be used without fear, except, perhaps, in the case of the most delicate tints.

METHODS OF ATTACKING PARASITES OF DOMESTIC ANIMALS.

By Herbert Osborn, Ames, Iowa.

In dealing with insect parasites of domestic animals we need to consider, first, the method of attack of these parasites, and we may conveniently separate them into the external parasites and the internal parasites. Among the former we have various species of lice, itch-mites, ticks, and can also include those forms which affect the external parts of the body by depositing eggs in sores. In the latter series we may include the different kinds of bot flies affecting the internal organs and certain forms of degraded Acarina which also affect certain internal organs. It is unnecessary here to detail the mode of attack of the external forms more than to mention that some pierce the skin to suck the blood, others simply feed upon external excretions, producing pustules, scabs, etc.

First among the methods of treatment we should consider that of prevention, since, for perhaps the majority of the parasitic forms, a little effort in the direction of prevention is far more effective than costly and laborious methods later on

With a large majority of parasitic species, including all of the lice, the sheep-infesting Hippoboscidæ and all of the Sarcoptidæ, infection results from the mingling of parasitized animals with those which are free from parasites. It is therefore possible by attention to animals introduced into a herd, or sometimes into a new section of country, to prevent entirely the introduction of the parasites. To accomplish this it is necessary to examine introduced animals, and if infested, or suspected of being infested, use thorough treatment upon these. In the case of introduced cattle infested with Hypoderma it would seem possible that they might, by being carefully watched and the grubs destroyed, be prevented from introducing this pest in any new locality. Since the parasite occurs only in the bodies of cattle during the winter season, I see no reason why attention to imported cattle should not serve to totally exclude this pest from any locality which has hitherto been free from it. The bots in horses may be prevented by the well-known method of shaving off the eggs, so as to prevent the introduction of the larvæ into the mouths, while for the bot fly affecting the sheep I am not aware of any more effective plan of prevention than that of applying tar to the noses of the sheep. For direct treatment, the methods for external parasites may be grouped under the head of washes, powders, and fumigation. The use of washes, in the treatment of parasites is perhaps one of the oldest methods. The modifications consist in the methods of applying or in the materials used as a wash. The method of application will depend somewhat upon circumstances, but should aim to reach all parts of the body, and particularly those parts most infested. Sponging the animal with a cloth or sponge dipped in the insecticide material and application by means of force pump in certain cases, particularly for hogs and thin-haired animals, is practicable in certain forms. A device recently presented by Dr. Francis, of Texas, provides for the pressure by means of gravity, the barrel being elevated on a derrick and connected by hose with several nozzles directed downward, and a movable one to use in spraying the under parts of the body, the liquid being collected by a drip platform in a receptacle below. The liquid, however, is elevated by a pump, and while it may lessen the number of men necessary in spraying, the same end can easily be accomplished where a force pump is at hand, if it is connected with several nozzles adjusted so as to play at proper angles on the animal. Dipping is probably the most speedy and effective method to use on a large scale, and especially for thick-haired or woolly animals, and for this purpose receptacles ranging all the way from a small tank for the treatment of a single animal at a time up to a large tank, including two or three dozen sheep at once, may be used. The ingredients for these washes have consisted mainly of tobacco, sulphur, lime, tar, kerosene, and arsenic, and each of these materials will be found to have its advocates.

Special formulæ for their combinations have been published in abundance, and need not be repeated here. Aside from these published formulæ there are different preparations on the market, some of which are doubtless valuable, and if the item of expense is considered satisfactory, it is perhaps proper to recommend their use. Kerosene emulsion

has been used with success by Prof. Gillette on cattle and hogs and by Dr. Orcutt and Mr. Alkrich for sheep dip, but Prof. Francis pronounces it less satisfactory than some of the proprietary combinations for ticks on cattle. I have also seen some reports of poor success with it or apparent injury, especially to lambs, from its use.

While I fully believe in its efficiency when properly made and applied and would attribute failures to improper preparation, the fact that such failures occur in practice is somewhat unfavorable to the general adoption of this remedy.

The various powders used are tobacco, sulphur, pyrethrum, snuff, and common road dust (the latter presumedly acting by closure of the spiracles) and of the other substances, tobacco or preparations including this material may probably be considered as most generally useful.

Pyrethrum if dusted in among the hairs so as to thoroughly reach the insects when first applied, is quite effective and may be used for fleas and lice, but probably would not affects the mites.

Fumigation is a method which presents some advantages where it is practicable, because it can be used during winter when washes are objectionable and is preferable to powders, because all of the individuals affecting an animal may be killed and thus entirely free it, whereas by the other method the survival of a few individuals may restock the animal. A simple plan of adopting this is to cover the animal with a blanket, leaving the eyes and nose exposed, but having the blanket reach the floor or ground and made as tight as possible at all points to prevent the escape of fumes. Puff tobacco smoke under this blanket by means of a bee-smoker. This plan first came to my notice as recommended by Mr. Charles Aldrich, who claims for it very effective work. I have also seen a description of a plan for fumigation of fowls which involves the same principles. Some years ago I suggested the plan of using a tight stall, with an opening at the head, a canvas protection, so as to leave the head, eyes, and nose exposed and free; and some experiments with this method showed that fumes of either sulphur or tobacco are very effective in destroying lice, both the Pediculidæ and Mallophagidæ. The time of exposure to the fumes varied from twenty to twenty five minutes in these experiments. The sulphur or tobacco were burned over an alcohol flame, but I should presume a preferable plan would be to place the substance in a tin or sheet-iron tube, closed at one end, with the open end projecting into the stall, and drive the fumes off by means of heat applied to the under surface. The common little lamp-stove could be used. The stall should be made as small as possible to accommodate the animal, in order that the fumes may be as dense as possible, and on this account the simple covering with a blanket is perhaps preferable, as it adjusts itself to the animal, but provision should be made for the free circulation of fumes on the parts of the animal where the blanket would press.

Feeding of sulphur with salt is strongly recommended by some, and Mr. Weed, of Mississippi Station, gives it a strong endorsement as a result of experiments at that station directed especially against the cattle tick (*Boophilus bovis*, Riley).

Mr. Gillette asked how the hen louse could be destroyed.

Mr. Osborn, in reply, said he thought the use of tar on the ends of the poles in the henhouse could be made to answer the purpose.

Mr. Aldrich thought it not safe to recommend kerosene for destroying insects on animals, because of the injurious effect on the skins of the host.

Mr. Gillette replied that he agreed that kerosene should not be used for sheep, but for hogs and cattle it was useful.

Mr. Riley remarked that he was deeply interested in a change of opinion resulting from later experience and experiments regarding the usefulness of the kerosene emulsion in destroying animal parasites, and particularly in Mr. Gillette's altered experience in reference to its use on sheep. He thought, however, that the difficulties of making a good kerosene emulsion and of getting intelligent farmers to use it safely were unnecessarily magnified. He could not accept the doctrine that of two given remedies the poorer one was to be recommended because the better required a little more care and intelligence in making and using.

Mr Hopkins had used sulphur for stock at all times and found it not injurious.

Mr. Weed reported that sulphur and salt mixed were fed to stock in Mississippi for ticks. Some thought it ineffective. But it was tried at the station and found to be a complete remedy. It had been claimed that sulphur used during wet weather was injurious, but this was tried and found not to be true. Sulphur has been supposed to cause a decrease in the quantity of milk, but careful experiments at the Mississippi Station had shown this to be untrue. The sulphur and salt should be kept in use constantly. Ticks, he thought, infested by preference, animals in poor health, and the chief good done by feeding sulphur and salt was keeping up the health of stock by destroying internal parasites.

Mr. Gillette inquired if the real bedbug ever occured in hen houses. A case occurred in Iowa where bugs, which appeared to be the same as that found in dwellings, were abundant.

Mr. Howard remarked that Townsend, of New Mexico, had recently discovered another species (*Cimex inodora*, Dugès) in henhouses.

Mr. Osborn thought the character of the form occuring in henhouses might be considered either varietal or specific.

In the paper by Mr. Weed on "Remedies for Insects Injurious to Cotton," the author discussed the application of Paris green against the Cotton Worm by means of bags at the extremities of a long pole carried by a "darkey" on a mule going at a brisk trot between the rows. This he considered to be the most simple apparatus which he had seen for distributing dry poisons. For the Boll Worm he considered the best application to be the planting of a row of corn about every tenth row through the cotton field at such a time that it will mature early in September.

THE CHEESE OR MEAT SKIPPER.

(*Piophila casei.*)

By Mary E. Murtfeldt, Kirkwood, Mo.

In dealing with the insects detrimental to agriculture the entomologist encounters no obstruction in the reluctance of the farmer to have his losses made known. With the pessimism characteristic of the profession, the latter is inclined to exaggerate rather than to make light of his difficulties and losses, and therefore gives the fullest publicity to any agency from which he suffers; but in the investigation of the habits and economic relations of an insect injurious to manufactured products the case is very different. The prudent manufacturer or merchant is very careful not to give to the public any fact which might arouse suspicion concerning the quality or durability of his products or wares. In the case of manufacturers such caution is especially necessary, as the tide of trade is so easily turned, and there are so many rivals in the field eager to take advantage of the smallest fact to the prejudice of a competitor. As an instance of this, one of our shoe manufacturers in St. Louis found, some years ago, that his stock was being injured by the Leather Beetle (*Dermestes vulpinus*, Fabr). In his desire for a remedy he very appropriately applied to Dr. Riley, of Washington, who instituted an investigation as to the nature of the depredator and the means for eliminating it. I had the honor to assist in these studies, and I well remember the change of manner in the proprietor of the concern between the first visits to his establishment and those made later. At first every facility for observation was granted, and all questions fully and obligingly answered; but subsequent visits were somewhat coldly received and very little information could be elicited, and there was a general air of desiring to ignore the whole matter. This was explained some time afterward, when a partner in a rival firm chanced to mention that his business had profited considerably by the publication that So-and-So's shoes were "wormy;" and the latter declared that the attention which the "bug-hunters" had drawn to the matter "had damaged his trade to the extent of several thousand dollars." Such experiences inculcate caution in mercantile circles, and through this the entomologist undoubtedly loses many an interesting subject for study. Perhaps this might be amended if it was understood that names would not be published without permission.

In the case of the insect upon which I beg here to offer a few notes, no household pest is, perhaps, better known. The manufacturer, the grocer, and the housekeeper, have each a considerable share in the loss which it occasions. For ages it has been the chief enemy of the cheese maker, the best and richest of his products being most liable to its attacks. It does not, however, confine its ravages to cheese, but within comparatively recent years has become known as an equally, or rather far more, formidable destroyer of cured meats, causing the loss of thousands of dollars' worth of property annually, and necessitating the spending of other thousands in labor and mechanical contrivances to keep it in check.

Although of European origin, it has spread to all parts of North America, where it probably does tenfold the damage that it does in its native country. In view of these facts, and considering the hundreds of articles that have been published upon insects of no greater economic importance, it is really surprising that the American records of this pest should be so few and so brief. Before entering upon an investigation of its habits I made a search for the literature of the subject, only to find that it had received but slight attention from our entomologists, from either a scientific or an economic standpoint. The only notes relating to it that are to be found in the annals of American Economic Entomology are the following:

In the *American Entomologist* (vol. II.), published in 1870, is a copy of an article by X. A. Willard, giving a somewhat elaborate account of the destructiveness of the insect as a "cheese fly," with various recommendations of measures to be taken in factories and storerooms to preserve the products from its attacks. Appended to this is an editorial note giving an outline of its life history, with the statement, that so far as was then known, it was exclusively a cheese pest. In volume III. of the same periodical, published in 1880, Dr. Riley briefly discusses it as an enemy of cured meats, here asserting its identity with the cheese fly. Dr. Packard, in his Guide, gives in a few lines its principal characteristics, and refers to an observation of Prof. Putnam concerning the method by which it "skips." In volume IV. of *Psyche* I remember to have seen something on the subject, but can not at present lay my hands upon the number containing it. In the report of the Entomological Society of Ontario for 1884 is also a brief paragraph of description of it as a cheese pest. Not doubting that there were other works not in my library in which it was more fully discussed, I applied to Dr. Williston, as our leading dipterologist, who very kindly answered:

I, also, have had occasion to search for the life history of *Piophila casei* without success. I suppose them [sic] to be accidentally in finding a fact, description of its habits, but was surprised to find no very [illegible] reference in any literature at my command. . . . If you have studied its habits you will do a service by publishing them, even though it may happen that they have already been published, which I doubt.

Dr. Riley, however, informs me that the literature of the insect is sufficiently extensive, though scattered, and that several European writers, and especially H. F. Bassow, have within recent years given careful accounts of its development and life history.

As it was my desire to bring the matter to the attention of the economic entomologists at the present meeting, I did not have time to obtain transcriptions from the authorities to which Dr. Riley refers, and so will offer here a popular synopsis of my personal observations, in which I am conscious there are some gaps and uncertainties. Those desiring a more minute and technical account can consult the works named by Dr. Riley.

My attention was directed to this pest about a year ago by an employee of one of the largest packing and curing establishments in the West, who wrote: "We wish to know what it is, and especially at what period in its life it can best be fought. It entails an enormous loss upon all our packing-house companies." Upon my request specimens of the infested meat were kindly sent me, and Mr. D——, my correspondent, gave me much valuable information concerning its work in the packing house.

The packages of ham and shoulder were received during the month of August, 1892, and consequently represented the worst work of the insect for the season. Swarms of flies escaped from the boxes as they were opened, and myriads of "skippers" and puparia in all stages of development were disclosed, clustering around the bony ends, among the tendons, and in the softer fat and oil saturated folds of the canvas wrappers. The lean meat was never in any case penetrated, although eggs and small skippers were abund-

on the surface ; nor was the solid fat much damaged. The methods of curing these meats had been so perfect, that even after an exposure of two or three weeks in an open shed to the August heats, upon cutting into the centre of a ham and the thickest part of shoulder they were found to be perfectly sound and sweet. In justice to the "skippers," too, I must say that their work does not induce putresence or ill odors, and although the spectacle of a ham swarming, externally, with the various forms of the insect is the reverse of appetizing, yet a large part of it is still edible, and, the outside removed, would be available for potted meats and similar preparations. But, of course, in the original shape it is absolutely unsaleable ; hence the loss.

The life history of the insect, so far as I have been able to trace it, is as follows, popularly presented : It hibernates in the perfect state, hiding, like the house fly, in cracks and crevices of the buildings which it frequents, and behind furniture and machinery. The flies become active only when warm weather sets in. According to my informant they are first noticed, in the curing establishments, around the vats of "yellow wash," which is composed of glue, rye flour, and coloring matter, possibly attracted by the odor of the glue. If not rigidly excluded they follow the pieces of canvassed and yellow-washed meat to the storerooms and deposit their eggs upon the wrappers, preferably among the folds, if they can find an opening that will admit them, otherwise upon spots where the fat has penetrated and loosened the wash. It has been difficult to ascertain the exact number of eggs laid by a single fly, as they are deposited not only in more or less compact clusters of from five to fifteen, but are also scattered singly. In the observation jars the average was about thirty, but it is possible that in these jars, confined upon small bits of meat and subject to much disturbance, the conditions were not normal, and the number of eggs may, in consequence, have been reduced. Those of an individual seemed to be all deposited about the same time, in the course of an hour or less, soon after which the insect perishes. The egg is pearly-white, slender oblong, slightly curved, 1^{mm} in length, with a diameter about one-fourth the length. Hatching takes place within thirty-six hours, and, leaving a filmy pellicle behind, the minute, translucent-white larva moves with wonderful activity in the direction of the food supply. Except in increase in size, it does not change much in its characteristics. It is cylindrical, tapering gradually toward the anterior end, and is truncate posteriorly, furnished at this extremity with two horny, projecting stigmata and a pair of fleshy filaments.

There is no variation in the white color except in the retracted mouth-hooks, which show a shade of dark gray. Dr. Packard, in his Guide, quotes from an observation of Prof. Putnam regarding the leaping power of the insect :

> When about to leap, the larva brings the under side of the abdomen toward the head while lying on its side, and reaching forward with its head and at the same time extending its mouth hooks, grapples by means of them with the hinder edge of the truncature, and pulling hard, suddenly withdraws them, jerking itself to a distance of four or five inches.

To my knowledge the distance to which it "skips" is often much greater. I think the "skipping" a latent power in the insect as a meat pest, as there is no occasion to exercise it by the majority of the individuals. When breeding in cheese it would be necessary in many cases to escape by this means to some place in which it could transform in safety, but on the canvased packages of ham and bacon the folds of the wrapper afford the most desirable of hiding places. It completes its growth in seven to eight days, attaining a length of from 7 to 9^{mm}, with a diameter at the posterior end of 1.5^{mm}. While feeding, if the food supply is sufficient, it does not move about much, entire clusters of larvæ often completing their growth in the same bony crevice in which the mother fly had deposited the eggs. When mature, however, it crawls, pulling itself along, apparently by the mouth hooks, into some fold of the wrapper that is comparatively dry, and from which the fly will easily be able to escape. Here it begins to contract in length and assume a yellowish hue, and the separation of the outer skin from the body can be clearly seen. The former gradually hardens and darkens into a golden brown, oblong segmented shell, 4 to 5^{mm} in length, and which still retains the larval projections on the posterior end. Within this puparium the larva rests for a time—I have reasons for believing for thirty-six or forty-eight hours, perhaps longer—unchanged, except for a slight reduction in size. I had occasion to observe the action of one of these larvæ whose case was accidentally broken. It wriggled and twisted about in the most unsatisfied manner, but seemed to

have lost its skipping power, and was constantly thrusting its head or its posterior extremity into the deserted puparia that were scattered at the bottom of the jar. Whether it was able to complete its transformations I can not now say.)

Both transformations, although involving such radical, formal and functional changes, take place within a period of ten days, as nearly as I have been able to ascertain.

The perfect insect is a shining black fly with bronzy tints on the thorax and slight iridescence of the wings. The latter overlap nearly to the tips when the insect is at rest. The legs are dull black, shaded at the joints to dull yellow or fuscous. In size it is about one-half that of the common house fly. There is no good figure of this insect in any American publication, that in Packard's Guide being in outline merely and not available for recognition except by the skilled entomologist. The fly is not active at night, but is able to perform its life work in the obscurity of partially darkened closets and storerooms. To make these absolutely dark would, in my judgment, effectually exclude it.

I have not been able to make it oviposit on fresh meat of any kind, nor does it seem able to breed upon that which is simply salted, but not smoked, not even when such meat is folded in wrapping papers. It will sip a little at sweets, but is not greatly attracted to them, while the odor of smoked meat speedily summons it. The average duration of life, in the perfect state, in summer, does not exceed a week, according to observations made upon it in the rearing jar, which may not, however, exactly indicate it. The entire life cycle would seem to be included within three weeks, but there is no definite succession of broods, and the insect may be found in all stages from May until October or November. When exposed to severe and protracted cold, larvæ, pupæ and flies are killed. The flies speedily succumb to the fumes of burning sulphur or pyrethrum powder, and the latter, if dusted upon them, produces the same stupefying effect that it does upon other Diptera. The firm in whose behalf these investigations were undertaken informs me that in order to exclude the fly they screened all windows and doors with a 24 to the inch wire mesh. They also, early in the spring, thoroughly whitewashed and fumigated smoke-houses and storerooms, using an admixture of carbolic acid in the whitewash, thus effectually sealing up or killing all hibernating individuals that might be lurking in these places. I have not been able to recommend any repellant chemical that could be safely incorporated with the wash used on the outside of the wrappers. Mr. D—— also informs me that sulphur fumes in the storerooms give a streaked and unattractive look to the wash, and the use of this repellant is therefore impracticable.

Smoked beef also suffers to some extent from the attacks of this insect, but, as Mr. D—— says, "not nearly so badly as pork. If a beef ham were hanging beside that of a hog, the former would most likely be O. K., while the latter would be stung."

In my correspondence with cheese manufacturers I learn that the loss of their products is now far less than it formerly was.

One of our leading cream-cheese makers writes:

We are always somewhat troubled with the cheese flies in summer. To keep them out of our curing rooms we cover the windows with light domestic, as they will go through the ordinary wire screen, but a there will always be more or less of them in the rooms, we have the house fly paper in water always on hand, which keeps them pretty well in check. They are a pest during the hot season. We do not use any chemicals, as they would be likely to injure the quality of the cheese. The flies deposit their eggs on the outside of the cheese, and in thirty to thirty-six hours the maggots begin to appear and work their way inside, so we usually go through the rooms every day and look for eggs. They are usually found on the south surface, but if the bandage is wrinkled or cracked we sometimes find them. We have not had over 5% worth destroyed in ten years, and are turning out 800 cheese per day.

Another large manufacturer informs me that he

depends mainly upon the success he has in keeping out the fly, and also darkens his curing-room; has each cheese rubbed hard each morning; uses no chemicals, but a cheese grease that contains lime-water, which gives a hard coating. Loss not more than 1 per cent., some years not over one-fourth of 1 per cent.

These reports are encouraging as showing with what comparative ease the insect may be kept in check when once its habits are thoroughly understood. It is hoped that these few notes, not in all particulars conclusive, may prove of some assistance in popularizing that knowledge.

Mr. Aldrich spoke of an English custom of placing cheese under the tap of a beer keg, so that the drip would encourage the development of the insect. He had been informed that the maggots improved the quality of the cheese.

Mr. Riley said it was true that this was not only an English, but a European practice.

Mr. Coquillett's paper, entitled, "Hydrocyanic Acid Gas as an Insecticide," was read by the Secretary. The paper consisted of an historical review of the use of this gas in California, together with an account of the methods in use at the present time and some slight consideration of its effect upon different insects. The cost of fumigating a tree varies from 5c. to $1, and even at the latter rate figures were produced to show that it is economical.

ON ARSENICAL SPRAYING OF FRUIT TREES WHILE IN BLOSSOM.

By J. A. Lintner, Albany, N. Y.

The long-mooted question: Are honey bees poisoned by arsenical spraying? is still an unsettled one. There are those who claim that a great mortality among bees is the result of their visiting blossoms that have been sprayed with Paris green, while others hold that the mortality so frequently observed at this time is ascribable to other causes, and that the arsenic would not reach the nectar of blossoms, and, being an insoluble substance, could not affect the bees or be communicated to the honey. This latter view has been entertained by some of our best botanists. The pollen, however, might contain arsenic and thus become poisonous, not only to the bees visiting the blossoms, but also to the nearly-matured, chyme-fed larvæ, to whom it might be conveyed.

In behalf of a committee appointed by the Association of Economic Entomologists to investigate the matter, Prof. F. M. Webster, of the Agricultural Experiment Station of Ohio, chairman of the committee, has recently reported progress in the investigations undertaken, to the following effect: He had experimented with a hive of bees placed underneath a sprayed plum tree wholly inclosed with a fine netting. Within two days thereafter a large number of dead bees were taken up from the cloth with which the ground had been covered. Without much doubt, most of these had been killed in their efforts to escape from their confinement. Examination of the bodies of the dead insects before washing and after they had been washed, to remove any arsenic that had been attached to their surface from contact with the sprayed blossoms, gave to the examining chemist the presence of arsenic. In another experiment made, hives of bees were placed under sprayed trees, but without any enclosing net These also gave dead bees with arsenic upon them, but in much smaller numbers.* The experiments were not deemed conclusive by Prof. Webster, and it is intended to continue them another year.

That the bodies of crushed bees that had visited blossoms sprayed with arsenic should disclose to chemical tests the presence of arsenic is not at all strange. Even an ammoniacal bath could not have removed every trace of arsenic from the surface of their bodies.

Prof. A. J. Cook, the distinguished apiarist of the Michigan State Agricultural College, makes the positive assertion that honey bees are killed in large numbers through the arsenical spraying of fruit trees in blossom, but he has not proven the assertion. Experiments instituted by him, in which bees fed on sweetened water poisoned by arsenic—1 pound to 200 gallons—were killed, are claimed by him as decisive upon the question under consideration. How entirely unwarranted the conclusion! The experiment had no bearing upon the question at issue. No one could have doubted that imbibing strongly poisoned syrup would be fatal to honey bees. Furthermore, in his experiment (see Report of the Michigan Board of Agriculture for 1891) the bees were fed in his laboratory, within a small cage. Bees are known to die very soon in confinement, even without an arsenical diet.

A simple method can be resorted to, by which the question could be definitely and effectually settled. It is this: Confine a hive of healthy bees to blossoms sprayed with Paris green, and when death speedily follows, have examination of their stomachs made

* It is possible that these bees may have been caught and killed by some of the predaceous insects, which are known to lie in wait among or near blossoms, whence they suddenly seize the bees and suck out their *juices*, such as the bee-slayer, *Phymata erosa*, and several of the "robber flies" or Asilidæ, of which Prof. A. J. Cook records six species having this habit.

by experts testing for arsenic. If it is found therein, then it may be accepted as the cause of their death. Examination of stomachs of bees collected promiscuously would not be satisfactory, for the statement was made at a recent bee-keepers' convention in Albany that honey bees had been seen eagerly feeding on the liquid resting on the leaves of a potato patch soon after it has been arsenically sprayed, and it was thought to have caused the death of many of the bees.

Up to the present, so far as I know, no examination such as above suggested has been made. I hope that Prof. Webster will undertake it in the progress of his experiments during the coming season.

Prof. Cook desires that "everyone of the United States should pass a law making it a misdemeanor to spray fruit trees while in blossom." I do not know that this, although urged in some of the States, has been done in any. Such a law was passed by the Ontario Legislature in April, 1890. It provides:

SEC. 1. No person in spraying or sprinkling fruit trees during the period within which such trees are in full bloom shall use, or cause to be used, any mixture containing Paris green or any other poisonous substance injurious to bees.

SEC. 2. Imposes a penalty, on conviction, of not less than $1 or more than $5, with or without costs of prosecution.

That the above law is calculated to protect the interests of both the fruit-grower and honey-producer is the opinion of Prof. J. H. Panton, of the Ontario Agricultural College, as given in Bulletin LXXXI, of the College, issued in November, 1892. He remarks:

Although there has been no analysis of the bodies of the dead bees for the purpose of ascertaining the presence of arsenic, still the death of the bees is so intimately associated with spraying that there seems but little reason to believe otherwise than that the bees have been poisoned by Paris green used in spraying. However, this will likely soon be settled by analysis of the bodies of bees suspected to have been poisoned, and I have no doubt arsenic will be detected.

There is another important question connected with the arsenical spraying of blossoms, viz, this: May not the arsenic blight the blossom and prevent fruit development? "The portion of pistil," says Prof. Panton, "upon which the pollen falls is exceedingly tender and sensitive, so much so that the application of such substances as Paris green injures it to so great an extent that the process of fertilization is affected and the development of fruit checked." No experiments known to me have been made upon the effect of arsenical spraying on fruit blossoms. That its effect would be to destroy the blossoms is quite probable. Thus, Mr. James Fletcher has suggested the spraying of the blossoms of pear trees infested with the Pear Midge (*Diplosis pyrivora*, Riley) as a remedy for annual attacks of the insect by depriving it of the food (within the young fruit) needed for its development.

There are, then, before the economic entomologist and the fruit-grower, at the present time, these two questions relating to spraying with the arsenites during the blossoming of fruit trees: First, will the poison kill the bees, destroy the young brood and affect the honey? Second, will it blight the blossoms? It would not be a difficult task for an experimental station, and it is specially within the province of the stations, to set these questions at rest and no longer leave them subject to crude observations or individual opinions. Until this shall be done, there should be an entire cessation from arsenical spraying of fruit trees while in blossom, without the enactment of laws which now seem premature and may prove to be not needed; and even if seeming to be needed, are still fraught with evil, from the general disregard with which such laws are treated.

It is unnecessary to say that there should be no restriction of the kind, either optional or compulsory, unless it is shown to be absolutely required. The arsenical spraying of fruit trees has already come to be regarded as almost indispensible to the successful fruit grower, and day by day its importance is being more fully and widely realized. No longer limited to the control of Codling Moth injury, it is being rapidly extended to other insect attacks. For each week of early spring, I have no doubt but that a calendar could be made wherein each day would stand for the incipiency of the attack by some insect pest or fungous disease, to be combatted in no better way than by arsenical or copper solutions used in spraying. What opportunities may therefore be lost for arresting and defeating attack at the most favorable time, and possibly at its only vulnerable stage, if two or three weeks' armistice is accorded to your enemies, during

which time the army is recruited a hundredfold, the infant becomes a veteran, mines are run, pits are dug, tents are built, covered ways are constructed, insidious mycelium threads are permeating leaf and twig, and in many other of the arts of warfare your wily foes, with their rich inheritance of surprising means for self-protection, have planted themselves in strongholds, where an entire park of spraying pumps, with their baneful poisons, will utterly fail of reaching and destroying them. Far better a cessation of hostilities for any six weeks later in the season than for three in early spring. It has been stated and reiterated many times that the Codling Moth is the only insect against which we need to employ the arsenites in early spring, but this is far from the truth. It is conceded that we can not destroy the Apple Worm until after the fruit is set and the egg deposited thereon, but of the two hundred and eighty known species of insect depredators on the Apple (not referring to those infesting other fruits) it would be strange indeed if there were no others which are specially vulnerable before the setting of the fruit. Let me name a few of those that could be reached at this time :

The well-known Apple-tree Tent caterpillar of *Clisiocampa americana*, Harris, attacks the bursting buds and the young leaves.

The caterpillars of the White-marked Tussock-moth (*Orgyia leucostigma*, Sm.-Abb.) hatch from the eggs about the middle of May and commence their destructive work.

Among the cut-worms there are a number of climbing species, four of which have been identified, viz , *Agrotis clandestina*, Harris, *A. scandens*, Riley, *A. messoria*, Harris, and *A. saucia*, Hübn., which are known to ascend apple and other fruit trees to feed upon the blossom and leaf-buds and the tender leaves. The odd-looking caterpillar of *Catocala grynea*, Cramer, feeds on the foliage of the apple in May, and those of *Catocala ultronia* Hübner, are often shaken from plum trees when jarring them for the curculio.

The Canker Worm (*Anisopteryx vernata*, Peck) usually appears as the young leaves are pushing from the bud.

The White Eugonia (*Eugonia subsignaria*, Hübn.) one of the family of measuring worms, occasionally appears in injurious numbers about the 1st of May.

The oblique-banded Leaf-roller of *Cacœcia rosaceana*, Harris, spins together the young leaves for its shelter.

The Lesser Apple-leaf Folder (*Teras minuta*, Rob.) attacks the opening foliage and folds the leaf for its retreat.

The Leaf-crumpler (*Phycis indiginella*, Zeller) awakening from its winter's sleep and drawing some of the unfolding leaves together, resumes its feeding.

The destructive Eye-spotted Bud-moth (*Tmetocera ocellana*, Schiff.) so injurious in Western New York, after its larval hibernation in its half-grown state, makes its formidable attack, first on the buds and afterwards on the leaves.

The Apple Bud-worm (*Eccopsis malana*, Fernald) creeps at night from its retreat and, after having consumed the terminal buds, feeds upon the leaves.

The Apple-tree Case-bearer (*Coleophora malivorella*, Riley) emerges from its peculiar pistol-shaped case in which it has passed the winter, to eat the buds as soon as they begin to swell, and afterwards to skeletonize the leaves.

The Plum Curculio (*Conotrachelus nenuphar*, Herbst) enters upon the scene at least two weeks before its first crescent cuts are made in the fruit, ready and free to devote all its energies to obtaining the supply of food needed for the development of its eggs and for the labors attending its complicated and painstaking method of oviposition.

Seventeen species of insects are named above, each one of which is feeding voraciously during the blossoming of our fruit trees. Possibly as many more could be added to the list, all of which could best be destroyed by arsenical spraying.

It is therefore respectfully submitted whether there should be the intermission of spraying as proposed, urged and sought to be made compulsory through legislation, until it shall appear beyond all controversy that the interests of the agriculturist and the fruit-grower—each carefully considered and perhaps weighed one against the other—really demand it.

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In the discussion following, Mr. Webster stated that he had as yet reached no positive opinion as to the poisoning of bees by spraying.

Mr. Garman had observed in one instance a bee alight on a recently sprayed tree and suck up from a leaf a drop of the liquid containing London purple. He had no doubt that thirsty bees did sometimes get in this way some of the poison, but whether it was sufficient to injure them or not was a question requiring investigation.

The fifth session was held on the afternoon of the 16th August. The following officers for the ensuing year were elected:

President ..... L. O. Howard.
First Vice-President ..... J. B. Smith.
Second Vice-President ..... F. L. Harvey.
Secretary ..... C. P. Gillette.

Three papers on the insects of the season in their respective localities were read by Messrs. Webster, Smith and Osborn, and were discussed by Mr. Riley.

A paper by Mr. R. Allan Wight, of Auckland, New Zealand, was read by Mr. Osborn. It was entitled "*Icerya purchasi* and *Vedalia cardinalis* in New Zealand." The paper consisted of a condensed summary of the history of these two insects in New Zealand and their inter-relations. This paper was discussed by Mr. Riley.

Mr. Smith then read a paper by Mr. F. W. Urich, of Port of Spain, Trinidad, consisting of "Notes on Some Insect Pests of Trinidad, B. W. I." The paper was an interesting summary of Mr. Urich's observations on the injurious insects of that island, and referred mainly to Coccidæ and their natural enemies, a leaf-cutting ant (*Atta sexdens*, a longicorn beetle (*Sternodonia depressum*) and certain Acrididæ. Especial mention of a little Cyprinodont fish was made. This fish is found commonly all through Trinidad and feeds upon mosquito larvæ. Mr. Urich suggests its introduction into America for use in tanks and ponds.

The Secretary then read a "Note on Slip records," by Mr. Cockerell. The author suggests the use of a uniform system of notes upon slips of a uniform size by all entomologists and submitted samples. The question was discussed by Messrs. Hopkins, Summers and Riley.

The Association then adjourned subject to the call of the Executive Committee.

BOOK NOTICES.

Experimental Farms: Reports for 1892. Printed by order of Parliament. Ottawa, 1893.

This valuable Blue book has been before us for some time, having been distributed in April last, but various circumstances have prevented us from noticing it, and several of the publications for which we are indebted to the courtesy of the authors. Our readers will, of course, be chiefly interested in the report of Mr. James Fletcher, the Entomologist and Botanist of the Central Experimental Farm at Ottawa, which occupies twenty four pages of the volume. After mentioning the chief insect attacks of the year, Mr. Fletcher gives an interesting and valuable account of the life-histories of the Hop-vine Borer (*Hydræcia immanis*, Guen.), the Red Turnip beetle (*Entomoscelis adonidis*, Fab.) the Western Blister Beetle (*Cantharis Nuttalli*, Say), and the Birch Bucculatrix (*B. Canadensisella*, Chamb.); in these there is much new and original matter as well as a summary of the previous observations of others. The identification of the Hop moth, which is also called from its mode of attack the "Collar worm of the Hop," is particularly interesting. Its injuries have been observed for more than twenty years, but it was a long time before the moth was reared from the destructive larvæ and its identity established.

The most effective remedy for this insect appears to be the encouragement of the unsavoury skunk in the hop-yards. In the northern part of the State of New York and in Wisconsin, this animal has been found most useful from its habit of digging round the infested plants and devouring the worms. The turnip and blister-beetles referred to have been very destructive in the Northwest Territories, the latter attacking the Windsor Bean, while the Birch Bucculatrix has infested the trees in the neighborhood of Ottawa. Mr. Fletcher also describes several useful parasites which serve to keep in check the currant and willow saw-flies and other injurious insects. The remainder of his report is devoted to an account of the Potato-blight, which affects the leaves of the plant and the Potato-rot affecting the tubers, and a chapter on Lawn Grasses and Fodder plants.

Catalogue of the Lepidopterous Super-family Noctuid.e Found in Boreal America. By John B. Smith, Sc.D. (Bulletin No. 44 of the United States National Museum) Smithsonian Institution, Washington, 1893.

This volume of four hundred and twenty-four pages will be heartily welcomed by every student of the Noctuidæ of North America. It is not a mere list of species but a complete bibliographical and synonymical catalogue. The authority, date and reference, are given for each genus, and under each species are given the date, author and place of publication of the original description, followed by any other publshed references, the synonymy, habitat and where the type can be found. Any one who has attempted to keep a record of the published references to our Lepidoptera—and we have all been compelled to do so in some form or other—will appreciate the immense amount of labor that Prof. Smith has performed in the preparation of this work, and must feel heartily grateful that he has now relieved us of a task that few are competent to accomplish satisfactorily. The saving of time and the satisfaction of knowing that one is not now likely to overlook anything that has been published regarding a species are no small boons to the student. For a full explanation of the origin and purpose of the work we must refer the reader to Prof. Smith's somewhat lengthy preface, which will be found well deserving of careful perusal. The general index at the end of the volume makes the work complete, and we have no hesitation in saying that it is the most useful publication on the North American Noctuidæ that has yet been issued from the press. We trust that the author will before long be able to lay us under still greater obligations to him by the publication of his contemplated monograph of the whole of this family of moths.

Brief Guide to the Commoner Butterflies of the Northern United States and Canada. By S. H. Scudder (Henry Holt & Co., 12 mo., pp. XI + 206, 1893).

It has been known for some time that Mr. Scudder has in preparation a Manual of the Butterflies of the Northern United States and Canada, similar to Gray's Manual of Plants, and all must agree that such a work is much needed. The present "Brief Guide" has, however, been produced in the meantime to meet a demand for something even less technical, by means of which boys and girls might be tempted to enter the ever charming fairy-land of science by having an easy way laid open before them. There are few objects in nature, which so soon thrust themselves upon the notice of young people as flowers and insects and of these none have been so useful as a first stepping stone or allurement to the realms of natural history as butterflies—"those winged creatures of beauty which add such a charm to the summer landscape."

There was not, however, until now, any work which could be placed in the hands of boys or girls who had caught a common butterfly, by means of which they could identify and find out something of the life-history of their newly-found treasure. This want Mr. Scudder has filled with his Brief Guide, in which he treats chiefly of those "butterflies—less than a hundred of them—which would almost surely be met with by any industrious collector in the course of a year's or two years' work in the more populous Northern States and in Canada." Should a young collector therefore be lucky enough to capture a butterfly not mentioned in the book, he may be sure that he has taken a rarity, which, as the author remarks, is "a discovery not always distressing to the amateur."

The introductory chapters, upon some of the points which will at once present themselves to a beginner are excellent—concise, clearly expressed and accurate, and treat of such subjects as :—What are butterflies, their structure, habits, variations and life-histories? There are three keys for identification, based on the perfect insect, the caterpillar and the egg, and pages 63 to 174 are taken up with short accounts systematically arranged of the insects treated of. There is a short glossary and an appendix giving instructions for collecting, rearing and studying butterflies.

On the whole this is a very useful little work, well prepared, convenient in size, well printed and well got up. It is, of course, arranged after the same system as Mr. Scudder's great work "The Butterflies of the Eastern United States and Canada," and many of the views there expressed are repeated here. The nomenclature is also the same, but the names more frequently used by other authors are also given. A good feature of the work is that the proper pronunciation of every name is shown by accents, and a popular English name is given for each species. The author's observations on dimorphism of some species, as of *Colias Eurytheme* and *Papilio Ajax* do not seem quite to agree with those published by Mr. W. H. Edwards. It would be difficult, however, to treat such subjects fully in the space allotted to each species in this Brief Guide, which, we think, all who use it will agree, is too brief, and they would like much more of it, of the same style. J. F.

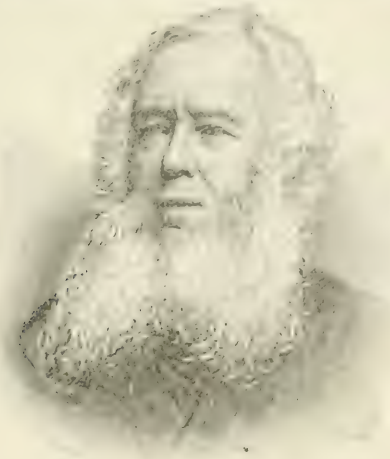

Fig. 30.

THE LATE PROFESSOR WESTWOOD.

OBITUARY.

The Late Professor Westwood.

We are much pleased to be able to give in this issue a likeness of the very eminent entomologist, Prof. Westwood, for which we are indebted to the kindness of the publishers of the *Illustrated London News*.

John Obadiah Westwood, M.A., F.L.S., etc., was born at Sheffield, England, on the 22nd of December, 1805, and died, shortly after completing his 87th year, on the 2nd of January last. His father was a die-sinker at Sheffield, but afterwards removed to Lichfield. When nearly 16 years of age he went to London to be articled to a solicitor, and though he devoted his attention more to the study of natural history than of law, he was admitted as a solicitor and became partner in a firm. Having some private means, which he augmented by writing and drawing, he was enabled to neglect his profession and give himself up almost entirely to entomology and archæology.

To quote Mr. McLachlan's obituary notice in *The Entomologist's Monthly Magazine*, "it was probably by his rare artistic talent that he acquired much of his justly great reputation. His drawings of insects were masterpieces of accuracy without the slightest attempt at effect and rapidly executed; few have equalled him in correct delineation. There certainly never has been an entomologist, who left behind him so much evidence, in practical work, of his ability to delineate insects, even to the most minute dissections. But Westwood was much more than an artist in entomology. There probably never has existed, and in the present state of the science there never can again exist, one who had so much general knowledge, both from personal investigation and a study of the works of others; one who was less of a specialist in the modern acceptation of the term. It is true he was a specialist, but it was in the way of taking up small groups in all orders and working them out thoroughly, his artistic talent giving merit and force to those small monographs. Under a somewhat brusque manner was concealed a hearty sympathy for all real workers, and if he offended, it was commonly in the way of pointing out to would-be introducers, etc., of supposed novelties, that some one or other had already made similar observations, his vast memory rendering him very dangerous in this respect. In society there could be no more genial companion, full of anecdote, but with small appreciation of humour. At home there could be no more generous host."

Professor Westwood was best known on this side of the Atlantic from his admirable work, "An Introduction to the Modern Classification of Insects," which was published in two volumes in 1839 and 1840. Every entomologist, worthy of the name, has no doubt made a study of this book, which still continues to be the best text-book on the subject in the English language. His sumptuous works on exotic insects, such as his "Arcana Entomologica," "Oriental Entomology," and his edition of Drury's "Exotic Insects," are also widely known, but his numerous contributions to various Natural History periodicals—a mere list of which would fill a volume—are not so familiar to our students. He was a most industrious and prolific writer, and made investigations in almost every family of insects in all the orders. His work is always characterized by its marvellous accuracy and patient elaboration of details, both of structure and habit; very rarely was he ever known to make a mistake.

He was actively associated with the Entomological Society of London from its foundation in 1833, and was for many years its secretary; subsequently he was elected President at three periods of two years each, and was made Honorary Life President when the Society celebrated its jubilee in 1883. He was a fellow of the Linnæan Society from 1827 and an Honorary or corresponding member of Scientific Societies all over the world.

In 1858 the Rev. F. W Hope, a wealthy amateur, who had been for years a warm friend and patron of Westwood, and had purchased his collections, gave them and his own to the University of Oxford, and founded a Professorship of Invertebrate Zoology, which bears his name. Westwood was appointed the first Hope Professor, and in consequence removed to Oxford, where he was a conspicuous figure in the University for five and thirty years.

Besides his entomological work he was a distinguished Archæologist and was widely known amongst those of kindred tastes by his investigations of the "Palæographia Sacra Pictoria," his "Lapidarium Walliæ" and "Facsimiles of the Miniatures and Ornaments of Anglo-Saxon and Irish Manuscripts." He formed a remarkable collection of carved ivories and inscribed stones, as well as of insects In all respects he was a remarkable man, and accomplished by dint of steady industry and enthusiastic perseverance during a long life, an amount of valuable scientific work that has rarely, if ever, been excelled.

C. J. S. B.

The Late H. T. Stainton, F.R.S., etc.

Another of the leaders of English Entomology has also been taken from us in the person of Mr. Henry Tibbats Stainton, who died at his residence, Mountsfield, Lewisham, near London, on the second of December, 1892, in the 71st year of his age, after an illness of several months' duration.

His early education was received at home, and it was there no doubt, that he acquired his unusual knowledge of foreign languages which at that time were little taught in English Schools. After spending some time at King's College, London, he engaged in

business, and during the years devoted to commercial pursuits, he acquired the well-known habits of punctuality, order and accuracy, which distinguished him through life. He was always prompt in answering letters and most courteous as a correspondent. The writer had the pleasure of making his personal acquaintance at Mottisfield in 1864, and found him most kind and genial; he also met him at one or two meetings of the Entomological Society of London. Being a very energetic worker, he published a large number of articles in various Natural History magazines and was himself the editor of the ten volumes of the *Entomologist's Weekly Intelligencer*; twenty volumes of the *Entomologist's Annual*, and joint editor from its foundation in 1864 to the end of his life (twenty-eight volumes) of *The Entomologist's Monthly Magazine*. His writings are for the most part devoted to the Micro Lepidoptera, in which group he was an acknowledged authority and possessed a world-wide reputation. Amongst his better-known works may be mentioned "Insecta Britannica Lepidoptera Tineina," one volume, 1854; a "Manual of British Butterflies and Moths," two volumes, 1857-9, a model of clearness, conciseness and accuracy, and most useful to all collectors of British Lepidoptera; "The Natural History of the Tineina," thirteen volumes, 1855-73 printed in four languages—English, French, German and Latin—in which splendid work he was assisted by Zeller, Frey and Douglas; "The Tineina of North America," one volume, 1874, being the collected writings of the late Dr. Brackenridge Clemens, edited and annotated by Mr. Stainton; "The Tineina of Syria and Asia Minor," one volume, 1864; "The Tineina of Southern Europe," one volume, 1869.

To the *Tineina* he devoted most of his time and attention, and of them he was a diligent collector both in Britain and on the continent of Europe, and a painstaking student. The result of his work was a complete revision of the European Micro Lepidoptera and the bringing into order and system of the various genera and species, to which little attention had been previously given. His name will long be held in high honour by entomologists everywhere, as one who devoted a long life to scientific investigation, and enriched the literature of his favorite pursuit with admirable works of great ability and unusual excellence, in which the literary portion was characterized by a charming and attractive style. C. J. S. B.

A Contrasted Summary of the Main External Characters of Butterflies in their Different Stages of Life.

By Samuel H. Scudder.

	Caterpillar.	Chrysalis.	Imago.
1. *Head as a whole*:	Independent; a globular case, its walls but little interrupted, except by sutures.	Soldered to thorax; mostly composed on an uninterrupted frontal plate.	Independent; a globose case, the sides almost entirely occupied by the compound eyes.
2. Eyes:	An arcuate series of simple ocelli, on the lower portion of the sides of the head	A slightly convex plate on each side, largely overlaid by the antennæ, leaving exposed only an arcuate band, in which are faint traces of facets.	A convex, usually strongly convex or globose mass occupying the sides, delicately and minutely facetted to form compound eyes.
3. Antennæ:	Brief, four-jointed, free, terminating in a bristle seated on the third joint.	Long, multiarticulate, folded over and appressed to the breast.	Long, multiarticulate, apically clubbed, extended, free.
4. Mandibles:	Well developed, free moving, chisel-edged or denticulate jaws.	A pair of subtriangular plates, soldered to the body.	Minute triangular immovable plates soldered to the body; or else wanting.*
5. Maxillæ:	A papilla, seated on a mammilate elevation, with little motion.	A pair of long soldered ribbons, lying side by side along the middle line of the breast.	A free coiled tongue, composed of two opposite similarly lateral halves, the union of which, by interlocking plates on the inner surfaces, forms a hollow canal.
6. Maxillary palpi:	An inner and an outer, the former of one or two, the latter of three minute joints, seated on the crown of the maxilla.	[Not exposed on the surface.]	A single pair, at most two jointed, excessively minute, seated on the extreme outer base of the spiral tongue.
7. Labium:	Similar to the maxillæ but median, and bearing besides palpi on the outer sides, a central tube, the spinneret.	[Not exposed on the surface.]	Merely a slight chitinous ridge for the support of the palpi.
8 Labial palpi:	A minute two-jointed appendage at the outer sides of the labium.	[Not exposed on the surface, lying beneath the expanded base of the maxillæ, sheathless.]	A highly developed three-jointed appendage on each side of the head, heavily scaled, and protecting the coiled tongue, the second joint usually much the largest, the whole usually longer than the head.
9. *Thorax as a whole*:	By its contour not regionally distinct from the abdomen.	By its contour but little distinct regionally from either the head or the abdomen, but more so from the latter than from the former.	By its contour completely and equally distinct regionally from the head and the abdomen.
10. Its subdivisions:	Essentially similar, the anterior joint generally distinguished by differing armature or by the presence of extrusive glands, and always by the presence of spiracles which are wanting on the other joints.	The mesothorax much the largest, and the prothorax so reduced that its spiracles infringe upon the mesothorax, which, like the metathorax, is unprovided with them.	The proportions of the chrysalis maintained, the prothorax often becoming a mere appressed plate as seen from above, and apterous, while the other joints bear wings and lack spiracles.
11. Its surface and clothing:	More or less shagreened and bearing relatively sparse hairs, spines, tubercles or	Smooth or roughened, generally with scant and brief trichomes or none, generally	Smooth, with even surface and no elevations, but densely clothed with hairs and scales.

	fleshy filaments and sometimes extensile glands.	with abrupt elevations, particularly in the middle of the mesonotum and at the base of the wings.	
12. Wings:	[Not visible externally, but existing as free internal membranous pads on the sides of the second and third segments.]	Folded over upon the breast as soldered chitinous pads, the front pair nearly covering the hinder.	Fully developed and free, covered with scales and often with hairs, especially at base and on the under surface.
13. Legs	Five paired, tapering, smooth, partially chitinous members, no longer than the segments which bear them, and ending in a curved claw.	Many pointed members, of which only the post femoral parts are exposed, and of these only the first two pairs of legs (the third concealed beneath the wings) folded over upon the breast, to which they are soldered, unarmed.	Long and slender members, consisting of five very unequal parts, only the distal three elongated and the fifth broken up into five unequal joints, the last bearing a pair of claws and often other terminal structures, and at least the distal half of the whole leg more or less scaled and often scaled.
14. Thoracic glands	Very generally present as evaginable median organs on the first segment, in some cases but external defenses, in others for unknown uses.	None known	None known, except such as have their opening in specially modified hairs or scales upon the wings or legs, when they appear to be always scent-organs.
15. Abdomen as a whole	By its sections not regionally distinct from the thorax, being a series of subequal rings, some of which bear fleshy, rather feebly jointed prolegs.	By its contour feebly distinct regionally from the thorax and at the base, beneath, overlaid by the thoracic appendages, but decidedly diminishing in size posteriorly; the position of the prolegs of the caterpillar often marked by scars.	By its contour completely distinct regionally from the thorax, with no ambulatory appendages.
16. Its surface and clothing	Similar to that of the thorax in the same stage.	Similar to that of the thorax in the same stage, but less frequently with special elevations, though these are sometimes very marked and most commonly longitudinally disposed.	Smooth and even, without elevations, densely clothed with scales.
17. The terminal segments	Besides an anal pair of prolegs, the upper portion of the terminal segment forms an anal plate of different form from the other segments.	Developed as a specially constructed cremaster, usually armed with hooks for the suspension of the chrysalis.	These segments are developed in the female into specially formed parts serving as ovipositor and vaginal vestibule; and in the male bear clasping organs both median and lateral of great diversity of form and armature, the latter often very complex.
18. Spiracles of abdomen	Situated one pair to a segment on the sides of the first to the eighth segments, the last pair sometimes placed at a higher level than the others.	As in the caterpillar, excepting on the eighth segment, where the spiracles have disappeared.	As in the chrysalis.
19. Abdominal glands	Often situated on some of the segments of the terminal half of the abdomen, either as modified or gastric organs, and secreting different uses, such as homes secreting or warning scents, or scent emitters.	None are known. †	Present occasionally, especially on the last two segments, generally as evaginable and odorous organs; but apparently in no case as developments of those found in the larval stage, abdominal scent organs rarely or never occurring in the same insect in two stages.

* See Kellogg's recent discussion in the Amer. Nat., v. 28.

† The chrysalis of one of the Heliconians is known to attract the attention of the mature opposite sex, but only shortly before the appearance of the image, when any attracting odors must arise from glands, strictly imaginal, the odors piercing the chrysalis shell.

ANNUAL REPORT

OF THE

FARMERS' INSTITUTES

OF THE

PROVINCE OF ONTARIO,

1893.

(PUBLISHED BY THE ONTARIO DEPARTMENT OF AGRICULTURE, TORONTO.)

PRINTED BY ORDER OF THE LEGISLATIVE ASSEMBLY.

TORONTO:
WARWICK BROS. & RUTTER, PRINTERS, 68 AND 70 FRONT STREET WEST.
1894.

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ANNUAL REPORT

OF THE

FARMERS' INSTITUTES OF ONTARIO.

To His Honor the Lieutenant Governor of Ontario.

The undersigned has the honor to present herewith the report of the Farmers' Institutes of Ontario for the past year. It contains the minutes of the seventh annual meeting of the Central Farmers' Institute held February 6th, 7th and 8th, 1894; condensed reports of the various local Institutes for the year ending June 30, 1893, and a number of selected addresses delivered at various Institutes throughout the province during the month of January, 1894.

Respectfully submitted,

JOHN DRYDEN,

Minister of Agriculture.

Toronto, April, 1894.

CENTRAL FARMERS' INSTITUTE.

OFFICERS FOR 1894.

President	James McEwing	Drayton.
Vice-President	T. G. Raynor	Rosehall.
Secretary-Treasurer	A. H. Pettit	Grimsby.
Auditors	Thos. A. Good	Brantford.
	George A. Aylesworth	Newburg.

Directors:

Division No. 1	J. C. Dance	Kingsmill.
" No. 2	Hon. Charles Drury	Crown Hill.
" No. 3	J. F. Beam	Black Creek.
" No. 4	D. McCrae	Guelph.
" No. 5	J. B. Ewing	Dartford.
" No. 6	R. J. Jelly	Jellyby.
" No. 7	Andrew Kennedy	Winchester.

LIST OF DELEGATES.

Institute Delegate.	Post Office Address.
ADDINGTON :	
Adam Gilmore	Tamworth.
Wm. M. Paul	Hinch.
BRANT, N. :	
H. R. Nixon	St. George.
BRANT, S. :	
John Z. Fraser	Burford.
BROCKVILLE :	
Jas. Cumming	Lyn.
R. J. Jelly	Jellyby.
BRUCE, C. :	
William Bowes	Pinkerton.
Wm. McBride	Paisley.
BRUCE, N. :	
J. B. Muir	North Bruce.
BRUCE, S. :	
Henry Thompson	Hollyrood.
Peter H. McKenzie	Lucknow, Drawer 7.
DUFFERIN :	
Geo. Island	Orangeville.
H. Graham	Whitfield.
DUNDAS :	
A. D. Harkness	Irena.
A. Kennedy	Winchester.
DURHAM, W. :	
H. C. Hoar	Bowmanville.
J. M. Jones	"
ELGIN, E. :	
R. H. Lindsay	Copenhagen.
J. C. Dance	Kingsmill.
ELGIN, W. :	
Jas. Beatty	Campbellton.
A. D. McGugan	Aldboro'.
ESSEX, N. :	
N. J. Clinton	Windsor.
FRONTENAC :	
Alex. Ritchie	Inverary.
Alfred Hunter	Harrowsmith.
GRENVILLE, S. :	
John Ferguson	Spencerville.
James Bissell	Brockville.
GREY, C. :	
John Clinton	Maxwell.
Thos. Clancy	"
Thomas Kelly	Vandeleur.
GREY, N. :	
James Smith	Owen Sound, Box 346.
Frank Reid	Annan.
GREY, S. :	
Robert Watson, jr	Varney.
Wm. Irwin	Landsdh.
HALDIMAND :	
R. P. Miller	Rainham Centre.
E. C. Cockshutt	Selkirk.
HALTON :	
Wm. J. W. Fisher	Burlington.
A. C. M. McLan	Nassagaweya.
HASTINGS, E. :	
J. C. Hanley	Read.
John Stokes	Thomasburg, Box 37.
HASTINGS, E. :	
Alex. Hisko	Walton.
Thos. Strachan	Brimacombe.
HURON, S. :	
S. J. Hogarth	Exeter.
John Kitchen	Brucefield.
HURON, W. :	
W. N. Howell	Carlow.
Andrew Currie	Wingham, Box 184.
KENT E. :	
Henry O'Neil	Tilbury.
J. H. Seary	Chatham.
KENT, W. :	
John Clackson	Chatham.
J. W. Fleming	"
LAMBTON, E. :	
John Hunter	Wyoming.
LAMBTON, N. :	
P. Naismith	Alvinston.
A. A. Smith	"
LANARK, S. :	
T. B. Moore	Lanark.
Wm. McCarry	McCarry.
LEEDS AND GRENVILLE, N. :	
George Hopkins	Merrickville.
William Keegan	Kemptville.
LEEDS, S. :	
C. F. Reid	Lansdowne.
John Bowes	Delta.
LENNOX :	
Uriah Sills	Napanee.
Fenton E. Aylesworth	Bath.
LINCOLN :	
A. H. Pettit (Secretary)	Grimsby.
J. Bawling	Port Dalhousie.
James Sheppard	Queenston.
MIDDLESEX, E. :	
S. B. Carroll	Ballymote.
Joseph Wheaton	Thorndale.
MIDDLESEX, N. :	
Peter Stewart	Parkhill.
S. P. Zavitz	Coldstream.
MIDDLESEX, W. :	
A. P. McDougall	Melbourne.
Mark Walker	Glencoe.
MUSKOKA :	
J. E. Oake	Wellington.
Jas. Hill	"
NIPISSING :	
Alex. Barron	Brandbridge.
NORFOLK, N. :	
J. H. Wadley	Simcoe.
E. L. Sovereign	Waterford.
NORFOLK, S. :	
Daniel Wisner	Port Ryerse.
A. W. Smith	Simcoe.
NORTHUMBERLAND, E. :	
W. H. Phillips	Frankford.
Walter Corbet	Warkworth.
J. B. Ewing	Dartford.
NORTHUMBERLAND, W. :	
R. Collin	Cobourg.
J. L. Stephenson	Cobourg.
OXFORD, N. :	
Thomas Feeny	Drumbo.
Selby Vendo	Beachville.
OXFORD, S. :	
Elmer Lee	Oakland.
G. B. Morrison	"
PEEL, N. :	
Rev. W. Farrow	Brampton.
John Hall	Bramp.
PERTH, S. :	
Valentine Foley	Sebas.
J. N. Cranberry	Woodstock.

LIST OF DELEGATES.—*Continued.*

Institute Delegate.	Post Office Address.
PEEL :	
D. E. Smith	Brampton.
Hugh C. Clarridge	Brampton, Box 256.
PERTH, N. :	
Duncan Stewart	Hampstead.
Donald Jack	Newton.
PERTH, S. :	
Nelson Monteith	Fairview.
William White	Mitchell.
PETERBOROUGH, E. :	
Francis Birdsall	Birdsall.
Ed. Hawthorne	Warsaw.
PETERBOROUGH, W. :	
H. C. Garbutt	Lakefield.
John A. Davidson	Peterborough.
PRESCOTT :	
Ralph LeRoy	Barb.
Chas. E. Byers	Hawkesbury.
PRINCE EDWARD :	
Alfred Brown	Bethel.
W. B. Leavens	Chisholm.
T. G. Raynor	Rose Hall.
RENFREW, N. :	
W. J. Childerhose	Cobden.
RENFREW, S. :	
William F. Gibbons	Northcote.
Robert A. Jamieson	Renfrew.
SIMCOE, C. :	
Chas. Rankin	Wyebridge.
James Robertson	Apto.
SIMCOE, E. :	
George Raikes	Barrie.
Hon. Chas. Drury	Crown Hill.
SIMCOE, S. :	
John Ross	Cookstown.
James Allan	Churchill.
SIMCOE, W. :	
W. A. Furlong	Nottawa.
John Smith	Duntroon.
STORMONT :	
D. H. McLean	South Finch.
VICTORIA, E. :	
J. H. Carnegie	Coboconk.
John Junkin	Bobcaygeon.
VICTORIA, W. :	
John Connolly	Lindsay.
W. M. Robson	Lindsay.
WATERLOO, S. :	
William Slater	Galt.
Chas. D. Brown	Haysville.
WELLAND :	
Hiram Goodwillie	Welland.
Leonard Buckton	"
J. F. Beam	Black Creek.
WELLINGTON, C. :	
Robert McQueen	Salem.
W. L. Gordon	Elora.
WELLINGTON, E. :	
W. H. Mallett	Teviotdale.
H. S. Roebuck	Arthur.
WELLINGTON, S. :	
G. B. Hood	Guelph.
P. Mahon	Aberfoyle.
WELLINGTON, W. :	
Caleb Lowes	Bosworth.
G. L. Page	Drayton.
James McEwing	"
WENTWORTH, S. :	
M. Pettit	Winona.
Thos. Macklem	Hamilton.
YORK, E. :	
Simpson Rennie	Milliken.
YORK, N. :	
B. F. Irwin	Sharon.
William Linton	Aurora.
YORK, W. :	
John A. McDonald	Mount Dennis.
W. C. Grubbe	Thistletown.

Other Associations.	Delegate.	Post Office Address.
Agricultural and Experimental Union	R. F. Holtermann	Brantford.
Agriculture and Arts Association	N. Awrey, M.P.P	Hamilton.
Ayrshire Breeders' Association	Henry Wade	Toronto.
Bee-Keepers' Association	Allen Pringle	Selby.
Clydesdale Association	David McCrae	Guelph.
Fruit-Growers' Association	Murray Pettit	Winona.
Western Dairymen's Association	J. W. Wheaton	London.
Creameries' Association	W. G. Walton	Hamilton.
Shorthorn Breeders' Association	Edward Jeffs	Bond Head.
Markham Farmers' Club	Fred. W. Jackes	Buttonville.
Ontario Veterinary College	W. Cowan, V.S.	Galt.

SEVENTH ANNUAL MEETING

OF THE

CENTRAL FARMERS' INSTITUTE.

The seventh annual meeting of the Central Farmers' Institute of Ontario was held in the parlor of Shaftesbury Hall, Toronto, February 6th, 7th and 8th, 1894.

The meeting was called to order at 2 p.m., when the Secretary, Mr. A. H. Pettit, read a telegram stating that the President, Mr. T. Lloyd-Jones, was ill and not able to leave home.

The Vice-President, Mr. D. M. Macpherson, being also absent, it was moved by Mr. Beam, seconded by Mr. Kells, that Mr. James McEwing be chairman *pro tem.* Carried.

ADDRESS OF THE CHAIRMAN.

Mr. McEwing then took the chair and addressed the meeting as follows:

I must thank you sincerely, in the first place, for the honor you have conferred upon upon me by placing me in this position, although, at the same time, I must say that I feel entirely unfitted for the duties devolving upon me. However, as the Secretary has already informed you, through unavoidable causes the President is unable to attend, and through some unknown cause the Vice-President is also unable to attend, and it is necessary to proceed with the business somewhere near the time for which the meeting was called. I may say that I am pleased to see such a fair gathering here at this early hour. It shows that the farmers of Ontario are taking a very keen and lively interest in the work being performed by the Farmers' Institutes throughout the province. You are well aware of the fact that the farming industry is attended with a great many difficulties at the present time, both in regard to decrease in the yield and also in regard to the extremely low prices now prevailing. But I may say that even under these adverse circumstances in this country, we still hold well to the front as an agricultural community. As you are all aware, at the World's Fair in Chicago last summer the Province of Ontario occupied a very honorable position indeed and it is well to carry on the work of the farmers' institutes along the line of still further advance in the interests of the farmers, so that the farmers of Ontario will still rank in the front of the agriculturists of the world. I do not propose to occupy any length of time in giving an address, from the fact that it is entirely unexpected on my part to appear in this position to-day. It certainly was about the last thing that I would have expected to happen, and under these circumstances you will not expect anything of that kind from me, so we will simply proceed now to carry on the business for which this meeting was called.

Moved by Mr. Good, and seconded, that the minutes of last meeting, as embodied in the report, be taken as read. Carried.

REPORT OF THE EXECUTIVE COMMITTEE.

To the Officers and Members of the Central Farmers' Institute of Ontario:

GENTLEMEN,—The Executive beg to tender the following report: Three executive meetings have been held during the year—the first at the close of the annual meeting Members all present except Mr. A. P. McDougald.

On motion it was decided that the Executive wait upon the Dominion Government at the earliest moment and present the views, as expressed by the Institute, respecting the removal of Customs duties on goods of British manufacture imported into Canada.

On motion the usual sum of fifty dollars was granted the retiring President. It was also decided that the Auditors' expenses be paid by the Institute.

The second meeting was held on March 8th at the Grand Union Hotel, Ottawa, when the selection of subjects for discussion at the next regular meeting was considered. It was also arranged to interview the Minister of Agriculture on the subject of the scarcity of farm laborers and domestic servants, and also to express our appreciation of the valuable experiments being conducted at the Experimental Farm by Prof. Wm. Saunders and his efficient staff in the interests of agriculture in this Dominion.

The third meeting was held in Toronto on December 8th, Mr. T. Lloyd Jones, President, in the chair. All the members present, and on motion the following was added to the rules of order and procedure: All resolutions brought forward embodying new business, other than that contained in the order paper, after being read from the chair, shall be by him referred to their respective committees, to be reported upon at the next regular session.

The subjects as contained in the order paper were then decided upon.

On motion the Hon. A. R. Angers, Minister of Agriculture of the Dominion; the Hon. John Dryden, Minister of Agriculture for the Province of Ontario, and Mr. Nicholas Awrey, M.P.P., Ontario Commissioner to the World's Fair, were invited to deliver addresses.

ABSTRACT OF TREASURER'S ACCOUNT.

RECEIPTS.

February 3rd, 1893, Balance on hand from last report	$ 677 03
November 22nd, 1893, To cash grant from Ontario Government	1,200 00
	$1,877 03

DISBURSEMENTS.

By cash paid	Printing, 1893	$ 27 85
"	Stenographer	60 00
"	Delegation *re* importation of British goods	209 15
"	Expenses Executive Committee, 1893	274 30
"	President's travelling expenses, as per resolution of Executive Committee	200 00
"	Expenses of delegate to Agricultural Congress, Chicago	60 00
"	Postage, express, and telegrams	14 34
"	Hall rent	15 00
"	Salary Secretary-Treasurer	250 00
	Balance on hand	766 39
		$1,877 03

(For Executive Committee),

A. H. PETTIT,

Secretary-Treasurer.

GRIMSBY, February 6th, 1894.

Moved by Mr. GOOD, seconded by Mr. KELLS, that the report of the Executive Committee and financial statement be adopted.

A MEMBER: I do not rise to make any objection to the adoption of this report, but I rise to make a suggestion that I would like to see in connection with this annual abstract of the Treasurer's account a comparison with other years. Perhaps it would not take much trouble, and if there was a comparative statement made with three or four years back it would show us at a glance whether our disbursements were increasing. I advocate the same thing with all our Treasurers' reports in our various municipalities.

The CHAIRMAN: I may just say that those reports have been issued yearly and nearly every member of the Institute I think has come into possession of one, and probably it would be just about as easy for them to refer to their annual reports for that information. In connection with this the Secretary is going to read a detailed statement of the expenditure, and perhaps it would be as well for that to be given before any motion is made in regard to this matter.

Mr. GOOD: For the information of this gentleman I can say that the Government grant the year before last was $1,600 and the balance on hand was $677.03; last year the Government grant was $1,200, $400 less than the previous year, while the balance on hand has increased $98.

Mr. GEORGE A. AYLESWORTH, of Newburg, Addington County, Ontario: I beg to offer a suggestion. In the minutes of our last annual meeting it appears that the Secretary's report, the report of the Executive Committee and the Auditors' report were considered together. I have now the Auditors' report, which will be the next order of business. In that there is a more detailed statement of expenditure and receipts than has yet been read to this meeting, and I think we will get at the object we are all aiming at—the promotion of the best interests of the farmers of Ontario—best by going on to the Auditors' report and then treating the Executive Committee's report, the Secretary Treasurer's report and the Auditors' report all together, and get through with them.

After some discussion the plan suggested by Mr. Aylesworth was adopted, when he read the following

REPORT OF THE AUDITORS.

TORONTO, February 6th, 1894.

To the Officers and Members of the Central Farmers' Institute:

GENTLEMEN,—We, your Auditors, beg leave to report that we have carefully examined the books, advices and vouchers of the Treasurer of this Institute for the year ending yesterday. We found in the Treasurer's book under dates 9th and 18th February 1893 two items of $7.25 and $3.60, totalling $10.85, as paid to Mr. Murray Pettit for railway fares and expenses: the corresponding voucher is receipted for an incorrect total of $11.85. The Treasurer appears to have paid to Mr. M. Pettit one dollar too much. Also we found an advice from the railway authorities showing the Treasurer entitled to a rebate of $25.05, while the Treasurer has charged himself upon his book with the receipt of $29, therefore we have entered upon the Treasurer's book for 1894 a credit item as due to Mr. A. H. Pettit (error of 1893 account) 95 cents. With these two exceptions we found the entries in the Treasurer's book to be verified by vouchers, correctly added and duly carried forward. The items are:

RECEIPTS.

Balance from last audit	$ 677 03
Grant (1893) from Ontario Government	1,200 00
Total receipts	$1,877 03

EXPENDITURE.

Rent of this hall, 1893 meeting	$ 15 00
Shorthand report, 1893 meeting	60 00
Printing	27 85
Ex President's travelling expenses (as per resolution of Ex. Com.)	50 00
President's travelling expenses (as per resolution of Ex. Com., a copy of which resolution we were not shown)	150 00
Expenses of Executive Committee of 1893	274 30
Expenses of Executive Committee to Dominion Government, Ottawa, re importation of British goods)	209 15
Expenses of Vice President as delegate to Agricultural Congress, Chicago	60 00
Salary Secretary Treasurer 1893	200 00
Postage and telegrams	14 34
Balance on hand	706 39
Total	$1,877 03

Sgd. THOS. A. GOOD,
GEORGE ASSON AYLESWORTH,
Auditors.

A MEMBER: How many gentlemen went to Ottawa on this delegation about the importation of British goods, and how long did they remain?

The SECRETARY: Ten were to go, nine went; Mr. Raynor was absent. They went down on the evening train and came back the next night on the night train.

The Secretary then read the itemized account of the expenses incurred by the delegation to Ottawa, and asked to be allowed to read an itemized account of the whole expenditure, but it was moved and seconded that the financial statement and Auditors' report be adopted. Moved in amendment that the items be read.

The CHAIRMAN: There is no desire to muzzle any man in regard to discussion on the financial report or anything else, so I think it is better to allow Mr. Pettit the right of giving a full and detailed statement of the expenditures.

The Secretary then read the itemized account of the whole expenditure.

Mr. MCCRAE: As to the expenses of the Executive Committee, they were here as delegates the same as we are here.

Mr. GOOD: The expenses of the Executive are not paid by the local institutes at all; hey are paid by this meeting.

A MEMBER: The Auditor who read the report stated there was one item of $150 for wnich there was no resolution shown. Can we have any explanation of that?

The SECRETARY: I cannot lay my hands at the moment on the report in which that resolution was passed, but I think it was in the second annual report, and it has always been paid since. There was a vote in this way, that $300 be set apart for the President and Secretary's travelling expenses in connection with visiting institutes $150 has always been paid the President, and at the close of the year the Executive have always voted him $50 more. As far as the Secretary is concerned he has never made any charge upon that fund at all, except I think it was the first year, I attended one meeting and some $30 expenses were incurred. But the Executive have always felt that the President's expenses were not really fully paid in any year. They have never called upon him to give a statement, but that has been a vote he has always had.

A MEMBER: The delegation to Ottawa seems rather large in numbers. Were they delegates from this Institute or did they take upon themselves as the Executive that power?

The SECRETARY: I think you will find the resolution in the report that the Executive Committee were authorized to lay this matter before the Government, and at a meeting held at the close of the annual meeting it was moved and seconded that they go in a body to present it to the Government.

A MEMBER: Did this Institute instruct them to do that?

The SECRETARY: No; the resolution was that the executive lay this matter before the Goverment at the earliest moment. The resolution is on page 32 of the report.

Mr. BEAM: I will try to give you what I know about the matter. There was a little difference as to what time to go, and as we could not go early in the session it was thought better perhaps to wait and see when it would be best to go. Finally it was decided to go and we all went. We were treated very kindly down there. I asked specially that we be heard by the Hon. Sir John Thompson and Mr. Foster. I asked Mr. Wallace and some other members, Senator Read, and I think Dr. Sproule and some others, whether we would not have some of the first members of the Government present, but Sir John Thompson was about to leave the country to go on the Behring Sea Arbitration and of course we could not have his attention at that time. But we did not get a hearing with Mr. Foster, Finance Minister, whom I especially wanted to have present at our meeting. We had a very fair hearing by the Hon. Mr. Wallace and later in the evening by the Minister of Agriculture, Mr. Angers. There were a number of able speeches made in advocating freer trade with Great Britain. Why should we not first extend reciprocity to England who gives us every favor? We have her markets, why should we not open our markets to her? That subject was discussed and our resolutions were received, and we were assured that proper attention would be given to them by the Government. On

the next day there was a report in one of the papers, and only the complimentary words of the Minister and Mr. Wallace were reported, not one word of any of the delegates was mentioned in the paper. I requested that the reporters should be present and supposed that they would be present, but that is all there was given.

Mr. KELLS: The question at issue, I understand, is the fruits of this deputation being sent to Ottawa; I can only say that the fruits are in bloom. We did not go for the purpose of working miracles at Ottawa, and cause fruit to come forth at the wag of our finger or the nod of our head. We had to make a start. We asked for something, but we were not so unreasonable as to think that such a thing would be granted before the legislators you send to Ottawa had considered whether we had a right to get it or not. Every fair-minded man will say that he does not want to take from the mechanic what that mechanic has a right to get, and we only want our rights. I am proud to say that there was not one man that stood shoulder to shoulder with me there that asked for more than the rights of the agriculturists of this country. I ask who is so well qualified to consider as the legislators we send to Ottawa what we should get? And if we get what we are entitled to get, I hold we have a right to be satisfied. I am still of the opinion that we will get free trade with England, we are looking forward to that time, but give our legislators a chance. As one of this deputation I am questioned as regards this expenditure, but I will sit down by saying that if you do get free trade with England by giving this deputation breakfast, dinner and bed you have made a good bargain.

A MEMBER: I think this matter is not worth wasting our time on much longer, and I think the detailed statement given should be amply sufficient for our information.

A MEMBER: I think at first sight you will agree with me that there is reasonable ground for objection to be taken to the expenditure. First, I would ask for information. Has it been usual to hold three meetings of the Executive in each year?

The SECRETARY: Yes.

A MEMBER: Then we find that they held on the 8th of March a meeting in Ottawa, we find an item of $274.30 for holding two Executive meetings here in Toronto, which, divided by two, will give $137.15 for each meeting. The cost of the Ottawa delegation was $209, so taking $137.15 from the $209 leaves only $72 as the cost of having the whole delegation going to Ottawa. I think, when it is considered in this way, it cannot reasonably be objected to, and I think we had better not spend any more time over the question.

The financial statement and Auditors' report were then adopted.

CORRESPONDENCE.

The SECRETARY then read the correspondence, which embraced a letter from Hon. Mr. Dryden in answer to the invitation extended to him to be present; also a letter from Hon. Mr. Angers, Minister of Agriculture for the Dominion, and one from President Mills of the O.A.C, in reference to the same matter; a resolution from the Central Farmers' Institute of Manitoba, with regard to the appointment of a delegation to Ottawa re tariff reform; a letter from Mr. Alan MacDougall, Secretary of the Canadian Institute, inviting the members to be present at a meeting in the interests of road reform to be held on the 9th inst., and a resolution from the Bracebridge Farmers' Institute in relation to statute labor and the management of our roads.

On motion of Mr. GOOD, the correspondence read was received and filed.

RESOLUTIONS

Prohibition. Moved by D. E. SMITH, seconded by T. G. RAYNOR, "That in the opinion of the members of the Central Farmers' Institute it would be beneficial to the welfare and prosperity of the Province of Ontario to have total prohibition, and that we request the Legislative Assembly of the Province of Ontario and the Parliament at Ottawa to use all

the power under their control to pass laws that will tend to prevent the sale, importation and manufacture of all intoxicating liquors, and that a copy of this resolution be sent to each."

The CHAIRMAN: I will refer that resolution to the Committee on Legislation, which is composed of Mr. Raynor, Mr. Strachan, Mr. McCrae, Mr. Jelly and Mr. Beam.

The Committee on New Business is Mr. McDougald, Mr. Good, Mr. Mahon, Mr. Pringle and Mr. Smith.

Farmer Representation. Moved by ROBERT WATSON, JR., seconded by GEO. A. AYLESWORTH, "That this Institute, composed of representative farmers from almost every electoral division in the Province of Ontario, rejoices at the remarkable progress in the past twelve months of the tendency of agriculturists of every shade of political complexion towards independence of political action and freedom from party thraldom; and whereas very many if not all of the burdens and grievances under which we labor are attributable to our hitherto divided condition and party professionalism, Be it therefore resolved that we hail with pleasure the action of the producers of all prosperity, the farmers and working classes, in placing candidates from their own ranks in the field to contest and forward the interests of the masses in our Provincial Assembly, as well as in the House of Commons, believing that our emancipation can only be brought about by placing in the councils of the nation men who are in every sense of the term representative of the masses, not the classes—the democracy, not the aristocracy."

The CHAIRMAN: I think it is better to leave the discussion on these matters until after we have had the report of the Committee. This resolution is simply asking this Convention to endorse the political action now being taken by the Patrons of Industry. I therefore refer it to the Committee on New Business.

Free Trade. Moved by ARCHIBALD HISLOP, seconded by JAMES ROBERTSON, "That in the opinion of this meeting a policy of free trade such as prevails in Great Britain would be beneficial to Canada." Referred to the Committee on Legislation.

Statute Labor. Moved by J. C. HANLEY, seconded by JOHN STOKES, "That the Central Farmers' Institute recommend that the Government of Ontario at its next session introduce an act providing for the total abolition of statute labor in municipalities settled for 50 years or upwards." Referred to the Committee on Legislation.

Municipal Voters. Moved by JAMES MACFARLANE, seconded by J. W. FLEMING, "That this Central Farmers' Institute do petition the Legislative Assembly of the Province of Ontario at its next session in 1894 to amend or change our municipal law to enable only owners of municipal property to vote at municipal elections, such voting to be by cumulative votes proportionate to the paid taxes for the previous year by each such voter." Referred to the Committee on Legislation.

Delegates. Moved by S. J. HOGARTH, seconded by JOHN KETCHUM, "That the number of delegates to the Central Farmers' Institute be reduced from two to one." Referred to the Committee on New Business.

Timber Limits. Moved by JOHN STOKES, seconded by J. C. HANLEY, "That this Central Farmers' Institute memorialize the Ontario Government to auction the timber limits of Ontario or a portion of them in small sections, thus leaving them within the means of owners of local saw-mills to purchase. This Institute believes that this would be in the general interest of the farmers of Ontario, inasmuch as the manufactured product would be brought within the easy reach of most farmers, and monopoly in lumber prevented." Referred to the Committee on New Business.

WORKINGMAN'S COMPENSATION FOR INJURIES' ACT.

The following report of the committee appointed to wait upon the Government *re* Workingman's Compensation for Injuries' Act was read by Mr. Murray Pettit:

Your special committee appointed at the last annual meeting to wait upon the Government *re* amendments to "The Workingman's Compensation for Injuries' Act" beg

leave to report, That we met on the of February, and drafted a petition and explanatory letter, which was sent to each county institute to be circulated and forwarded to their respective members. We arranged for an interview with the Government on the 19th day of April. Unfortunately Mr. Awrey was at that time in Chicago. Your committee was joined and assisted by several members of the Legislative Assembly, also Messrs. Foran, Carpenter and Cline from Wentworth County. We were very courteously received and heard by the Premier, Mr. Mowat, Hon. Messrs. Hardy, Dryden, Gibson and Ross. I am pleased to say that the Act has been amended as we petitioned, and the farmers of this province have been relieved of this liability. All of which is respectfully submitted.

M. Pettit, Chairman.

The Chairman: In regard to the success or non-success of the delegation to wait upon the Dominion Government *re* free trade with Great Britain, as already stated, arrangements were made for an interview with the Government and the deputation went down. Through press of business, I suppose, the Government was unable to accord that deputation an interview at the time when we first arranged for it, but later on, on the following day, the committee met Mr. Clark Wallace as representing the Government. They were unable to meet either the Minister of Customs or the Minister of Finance or the acting Premier. Perhaps this meeting may consider, and perhaps justly consider, that a deputation sent down from a body such as this was at least entitled to the considerate hearing of some members of the Government. I felt so myself. I may say further that it made no difference to me individually whether they paid that respect to my wishes or not, but as representing you and as representing the farmers of Ontario, I felt that we were at least entitled to that courtesy. However, each and all of that deputation were heard by Mr. Wallace. We had a few words from Mr Wallace in regard to some of the difficulties that might be in the way of acceding to our request, but beyond that there was nothing occurred from the fact that there appeared to be another deputation waiting right behind us to have an interview in regard to some other question, and after we had placed the matter fairly and fully before him we retired. As to the fruits of that visit, there is a seed time and there is a harvest; it has not come harvest time yet. We were sowing the seed as per instructions, and we hope to reap the harvest in the near future, the nearer the better. The House of Commons, I suppose, will meet within a few weeks, and I understand they are drafting a tariff bill dealing with the question of tariff rates on foreign goods, and I suppose then we will see what the harvest will be and judge whether it will be satisfactory or not.

A Member: I see at that meeting it was arranged to interview the Government as to the scarcity of farm laborers and domestic servants. Can you give us any information on that point?

The Chairman: Yes, that committee did interview the Minister of Agriculture, and met with a very cordial reception, and received the assurance that he would take it into his most serious consideration. And further than that, there is a large amount of correspondence as to that between the Government and our Secretary if you would like to hear it.

The Secretary: I will not undertake to read the correspondence, but, I may say that our report was sent to the High Commissioner in London, Eng. It was reported through the press, and Mr. Hutchman, I think, wrote saying that he had about 100 young fellows between the ages of 20 and 25 ready to come to this country. I also got a report later on that a large number were ready at any time and they were in all probability coming, and with letters of introduction to the Immigration Department and to your Secretary at Grimsby. I was in Chicago at the time and I at once wired them that I supposed this matter would be dealt with by the Immigration Department, as I did not wish 50 or 60 of them to land at Grimsby looking for your Secretary, because we were not prepared to deal with that question. However, that is the substance of the whole correspondence; there were a large number ready to come, but no arrangements made with this Institute, therefore it was simply referred to the Immigration Department.

Mr. JAMES SMITH: Were these farm laborers to be sent out, or were they other persons?

The SECRETARY: They had been accustomed to farm labor all their lives, and were, as the gentleman remarked, "as fine a lot of men as could be picked in all England."

Mr. JAMES SMITH: If I could get a laborer of the right class I would be glad to get him and give him constant employment. But I got a laborer this winter who had not been accustomed to farm labor, shortly out from the old country, and I soon found that although he was only employed to receive his board I had agreed to pay him too much, and after keeping him for a short time I had to tell him that he would have to look for another employer.

A MEMBER: In regard to American hogs being brought into this country, was anything said about that.

The SECRETARY: I sent the communication to which you refer to the Department and this is the reply I received, "I am requested to acknowledge your letter dated 3rd inst to the Minister of Agriculture on the subject of a resolution of the Central Farmers' Institute *re* Health of Canadian Cattle and urging that schedule be removed."

The CHAIRMAN: The matter as to the hogs was also placed before the Government

EMPLOYERS' LIABILITY ACT.

Mr. HANLEY: I think as a matter of courtesy this Institute should acknowledge the ready action the Ontario Government took in regard to the suggestion we made as to the Employers' Liability Act. When either Government, Dominion or Provincial, accede to our requests I think it is almost our duty to acknowledge their attention. I therefore move, seconded by Mr. STOKES, That the thanks of this Institute be tendered to the Government of Ontario for their ready adoption of their suggestions *re* Employers' Liability Act.—Carried.

REDUCTION OF DUTIES ON COMMODITIES.

Moved by N. J. CLINTON, seconded by ELMER LICK, That it is the feeling of the Central Farmers' Institute, in meeting assembled, that the Executive Committee look into the question of having the duty on certain commodities reduced, which would be beneficial to the farming community at large, and that a committee of five of that number join with the delegation from Manitoba in memorializing the Government towards that end, and the Secretary be instructed to notify them of our action.

Mr. CLINTON: The Government have got to deal with this question now; they are in duty bound. We are not to look at this thing from either side of politics. The time has come when we have got to take a stand, as the prohibition people are doing. They are working for prohibition, and if you don't support prohibition they are not going to support you. Now, we ought to do the same as farmers, and if we cannot get the duties on certain goods reduced along our line we are not going to support the men that don't support that.

The CHAIRMAN: I think it was agreed that there was to be no discussion on any matter placed before the chair until it had been reported on by the proper committee. I will refer this to the Committee on Legislation.

ADDRESS BY N. AWREY, M.P.P.

Mr. NICHOLAS AWREY, M.P.P., was then invited to address the meeting, which he did as follows: I would just like to commence by congratulating the farmers assembled here on the magnificent gathering that we have. It was prophesied five or six years ago that the annual meeting of the farmers of this Province would grow smaller by degrees and beautifully less, but our experience is that as time goes on and farmers read and think for themselves, that the Institute increases instead of decreases, and to-day, for the first

afternoon of our meeting, we have a gathering here of representative farmers that would do credit to any legislative assembly that gathers in any part of the American continent. Honest, intelligent, progressive farmers, meet here to discuss questions of peculiar interest to them as a class; and what I have admired, and what is to be admired when we come to think of the farmers, is their determination never to ask for anything unreasonable. I have admired them for that one thing. Unfortunately, other classes, in discussing questions of public policy, appear to have but the one object in view—that is, the bettering of their own condition, even at the expense of the other members of society; but I have always noticed that the farmers take the broad ground, when they ask for anything, that it is going to be beneficial not only to themselves, but to the entire community. They never want anything personally good for themselves and a disadvantage to anybody else. And so long as we discuss these questions along those lines, so long as we ask nothing that would be detrimental to any other section of the community, so long must our efforts prevail, because justice will prevail in the end. I care not how slow, how long it takes, a reform that is a reform, and an honest, just demand on behalf of the people of the Province, will be acceded to in time, because politicians—and I suppose you might class me as one—study very carefully the public pulse, and when the feelings of the people reach out in any particular direction you will always find that the politicians are going in that direction too, practically being forced along by a popular demand, if the demand is a just one. Yet, as a public man, I want to tell you I have very little sympathy with the public man who will yield to the popular demand for the sake of saving his position as a public man. I like the man who believes in doing right, and if he believes that a certain line of action is wrong, will resist the demand even at the expense of his position. At the same time, I admire the man who is prepared to say that he is willing to consult the will of the public—the greatest good to the greatest number. For some years I was your presiding officer—through the stormiest time, perhaps, when discussions waxed warm and men grew eloquent over debatable questions; and I want to warn you now, because I see looming up in this assembly to-day questions which will arouse a considerable amount of warm discussion, against forgetting for the time being that you are public men. If you are determined to discuss these questions, do it as men, do it as lovers of your country, for the good of your country, not to gain any particular object for any particular party or any particular subdivision of a party. Discuss these questions on the broad ground that it is going to be a benefit to the entire province. And I want to warn you, too, against allowing to creep into this farmers' meeting questions which, after all, should not place you in the position of being the advocates of everything for the farmer. Now, I admire the farming community. I am one of yourselves. There is no class of work on a farm that I have not done—digging ditches, hauling manure, drawing cordwood, cutting cordwood and cutting firewood—and that is the worst thing a man can do. I have done all these things, and I tell you there is just this danger at the present moment, that we as farmers will go beyond the fair line of demarcation between prudence and imprudence. We may demand everything for ourselves. Let me tell you now that, I think, in rural constituencies, if you have a farmer able to advocate your interests and take an intelligent interest in public affairs, it is all right to have him as a representative. We have not had enough of them in either House before. But do not make it a principle that a farmer and nobody else must be in the House, because sometimes there is a man of peculiar worth and ability who is able, even beyond the ordinary man, to work for the common interest of the entire people. It is utterly impossible for us all to agree upon every question which may be introduced here. But let us discuss them without getting angry, discuss them as statesmen would discuss them, argue the questions fairly and squarely without prejudice to any man, and arrive at our conclusions honestly, without bitterness or without a determination to do any particular party, or any particular subdivision of any party, any good or harm just at this present juncture. That is what we are here for.

Now, I want to say a word to you about the success of the farmers at the Columbian Exhibition. I want to tell you that the record that you have made as farmers from the Province of Ontario is such a one that the German people, the French people, the people from Sweden and from Austria, have determined to take the catalogues of grain as

exhibited by you people from Ontario, the statistics which were furnished them; they propose to publish in the German language, in the French language, in the Swedish language, pamphlets advising their people to come to the Province of Ontario. The largest breeder of stock in Illinois, Mr. Burgess, in giving his opinion, as it is recorded in the visitors' book in the Agricultural Court of Ontario, and a man who has been for years trying to improve the quality of the stock in Illinois, said: "I have determined that a land that can produce such cereals as I see here upon exhibition is a land where the people ought to be prosperous and happy, and I would advise the farmers of the State of Illinois to select their grain for sowing from the granaries of the farmers of the Province of Ontario." That was a compliment paid to you men by the largest agriculturist, or at least the most enterprising stock raiser and agriculturist, in the State of Illinois. We received at the hands of the jurors, one of whom was from Russia, one was from France, one of them from the Southern States, and one of them from the Western States, and one from Canada, after examining the cereals from the Province of Ontario and their arrangement, an award for artistic arrangement of our exhibits, the quality of the exhibit and the quantity, one of three awards that were given to all the States and countries on the face of the earth.

Then let me tell you something else for your encouragement. I must say to the people of Ontario that they fought the battle at Chicago against great odds, as the stock of the Province of Ontario, and especially the cattle, had to submit to a quarantine of 90 days coming back into this country; and yet of all the stock we took over there every animal averaged a prize of $30 as far as the cattle were concerned. In some classes we swept the board. It was rather amusing when Ayrshire cattle were being exhibited. The man who announced the prizes around that large amphitheatre was an American colonel, and as one prize after another went to Canada, first, second and third in each class, he rode around saying, "First prize to Ontario, second prize to Ontario," and so on, until at last he said: "Gentlemen, there is no use of my riding around here any more; when the United States gets a prize I'll come around and tell you." When it came to sheep in most of the classes the people of Ontario practically swept the board. In Leicesters and Lincolns the people of the United States were nowhere. I think I never was prouder than I was when I recognized that little Ontario, a young country just upon the threshold of its national existence—learning, as we would say, to walk,—that the Province of Ontario alone took 33⅓ per cent. of all the prize money that was given to the people of all the world for stock. (Applause.) And when I thought of that, and thought of my country, its resources and its people, I think I never was prouder to write myself down as a Canadian. I then fully realized the fact that in all that went to make a country great and prosperous the agriculturists of my own country had practically shown themselves to be the peers and the superiors of the tillers of the soil of any other country on the face of God's earth. From Japan, and also from Germany, they propose to send students to our Agricultural College at Guelph to study our system of farming. To-day the Province of Ontario is known, I believe, in every country on the face of the earth as the one country where people have a soil which will give, by proper care and culture, a living to all who wish to settle within its boundaries. I remember that one American Commissioner, speaking at one of our meetings, said that if he represented the Province of Ontario he would shout himself hoarse over the character of the exhibits which came from there. And it is a fact that our fruit, in the later stages when the peaches and apricots, the grapes, plums and cherries came in, overflowed that large court of ours and went into the Northwest territories. Then we went on and took possession of part of Dakota's territory, until we began to wonder whether Mr. Pettit would not march his forces up and take possession of Washington before he got through. One man from the city of London, the largest wine merchant in that great city, visited my office. I was talking about the cultivation of grapes, and I said, "It is true that we don't manufacture wine for exportation, but we grow magnificent grapes." He looked at me with that look you know these men have through an eye-glass, and he said, "You don't tell me you raise grapes in Ontario?" "Yes, sir," I said. "Oh, well," he says, "have you not got into the way of these western people of blowing a little?" But when I described our country I admired the pluck of that Briton. He came to Niagara the next day or so, went and hired a rig and drove all the way up through the Niagara peninsula, took the train at

Hamilton and went up to Essex and Kent, and then came back to me in two or three weeks and told me, "I came back to tell you that you told the truth." I said, "That looks as if you thought I hadn't told the truth." "Well," he said, "I thought you were enlarging, but" he said, "you have the most magnificent fruit country upon which the sun ever shone." He went home to old England and sent his two nephews with letters of introduction to me, and they went over the same territory. And he declared that if the people of the old land knew of these spots, which we might speak of as like Eden before our forefathers transgressed, they would be coming in shoals to take up their five and ten acres of land, because in England ten acres is a pretty good farm. They would practically invade our country and take possession of our fruit belt and would be prepared to pay immense prices for our land. And more than that, and I think my friend Mr. Pettit will bear me out, the people of the southern States said that there was there an unlimited market for our fruit; that theirs were gone, and if our winter apples would keep in their climate, that there was no reason why every bushel of apples grown in the province of Ontario should not go across to the southern States for consumption there. I believe Mr. Pettit has sent some samples already over there, a car load or two. We are known now as a country rich in all that goes to make up a prosperous people; and it is largely due to the fruit men, because I am bound to say it was the fruit men, the stock men, the honey men, the farmers--

A MEMBER: Don't forget the cheese men.

Mr. AWREY: Well, the cheese men too; we claim them all, because the cheese industry is simply a part of the great work of the farmers. It is the farmers that supply the milk from which the cheese is made, and these men—the farmers, the stock raisers, the fruit men and the bee men—were the men that made our exhibit at Chicago. The only weak part in our exhibit was that of the manufacturer. And if there is any credit accruing to the Province of Ontario to day, gentlemen, on account of the wonderful showing we made at Chicago, it is to you men that deserve the credit, the tillers of the soil. It was your enterprise, your skill, your forethought, your determination to make our country appear in a proper light, that made us what we were in the city of Chicago. Why, the man who first suggested the World's Columbian Exhibition, Dr. Zerambly, from Mexico, came into our agricultural court and recorded there over his signature—the man who worked for four years to have that exhibit brought together—that it was the finest exhibit of cereals that was on exhibition in Chicago. You were the men who sent it, the toilers, the common people, the ones who form the superstructure upon which all other people build to make a nation, because if we are not prosperous there is nobody prosperous in the country. I want to congratulate you upon that fact; and I want to tell you it is you--it is not the millionaires, it is not the bloated manufacturer, it is not the man who rides in his carriage, who has brought prestige to the Province of Ontario—it is the farmers and the cheese men, the lowly, humble, honest workers in our country who have added lustre to the name of Ontario and who deserve the thanks.

I am glad to know that our Central Institute is being enlarged and its influence is being felt, because we are a band of earnest workers, seekers after knowledge—knowledge which will benefit not only ourselves but the country at large. I congratulate you upon the success of the meeting, Mr. Chairman, and the success of the Central Institute.

A cordial vote of thanks to Mr. Awrey for his address, and for the success achieved by him on behalf of the Province of Ontario at the Chicago Exhibition, was then moved by Mr. GEORGE A. AYLESWORTH, seconded by Mr. JELLY, and carried by a standing vote.

GENERAL BUSINESS.

Superannuation and Pensions. Moved by JOHN Z. FRASER, seconded by THOS. A. GOOD, "That we, the farmers of Ontario in the Central Farmers' Institute assembled, condemn the present system of granting retiring allowances or superannuations to various servants of our Dominion and Provincial Governments, and that the President of this Institute be authorized to appoint a committee to wait upon the Governments mentioned to lay this matter before them and request the abolition of such evils. And also to wait upon the

Minister of Militia and Defence and request that the question now pending of granting pensions to certain officers of our militia be not entertained." Referred to the Committee on Legislation.

Scrub Bulls. Moved by WILLIAM LINTON, Aurora, seconded by B. F. IRWIN, Sharon, "That a deputation composed of the following gentlemen, namely, the mover, B. F. Irwin, Mr. McCrae and D. E. Smith, wait on the Hon. John Dryden to formulate some scheme whereby the scrub bulls, and in fact scrub animals of all descriptions, can be blotted from the face of the land"

The CHAIRMAN: I would like to know the way he proposes to do away with them.

Mr. LINTON: They have done away with the Provincial Exhibition, I think they are doing away with the Provincial plowing matches and prizes to farms, etc., and I propose to Mr. Dryden and the Provincial Board that they establish an annual sale, at any rate two or three sales in different parts of this province, of bulls of all pure breeds. The Americans recognize Ontario as the breeding ground of this continent. They know where Toronto is, but they don't know where Aurora is or Sharon, and if there was an annual sale established by the Agriculture and Arts Association through the Government, or whatever way you propose to fix it, the people throughout the whole United States could come to this country and buy these animals. The Association could publish a catalogue and advertise this sale all over. A new beginner in any pure breed buys two cows for instance, and in three or four years he gets three or four bulls that are eating their heads off. The American wants these animals if he only knew where to get them, and if this was an annual sale the consequence would be that a large portion of this community will go into breeding thoroughbred cattle and sheep of different breeds, and it will make this country head and shoulders above any State in the Union—which it is to-day. I propose that the Provincial Association take hold of this thing to present it in its proper shape to the American people, and if they do the Americans will buy our stock and we will find we cannot produce enough of them.

Mr. WADE: The Agriculture and Arts Association has already asked for $1,000 from the Government for the purpose he mentions.

Mr. AWREY: I think the scheme as suggested has already been adopted by the Agriculture and Arts Association, and that part of the resolution I suppose he won't care to press, but the other part of it, to get rid of scrub bulls and other animals, that can be done by castrating them before they get two months old. That is about the only way, for the Government certainly cannot pass a law to compel a man to kill them. The scheme adopted by the Association is to hold a sale every spring I think.

Mr. WADE: I think it will be more in the fall of the year on account of tup lambs, and to hold it in two different parts of the Province.

Cattle Embargo. Moved by D. MCCRAE, seconded by J. PAWLING, "That this Central Farmers' Institute take steps to urge our Government to endeavor to have our cattle admitted to the markets of Britain and the United States." Referred to the Committee on Legislation.

Mr. MCCRAE: You are aware that some time ago an embargo was put upon our cattle landing alive in Great Britain, and they have to be slaughtered at the port of entry. It is unfortunate that such a thing is the case, but it was followed immediately by the United States taking steps in the same direction. They say, "We don't believe there is any disease in your country, but the British Government says there is and we are bound to take their word for it, and we won't allow your cattle to cross our boundary without being slaughtered." That is the position to day. Now I think that some steps should be taken to show that there is no disease in our country, as I believe there is none. Any of the gentlemen who are breeding live stock here know that one of our best markets in the past has been the American market, and we are practically shut out of it at the present time.

Testing Grain. Moved by J. HILL, seconded by H. GOODWILLIE, "That this Institute memorialize the Dominion Government to so change the present law *re* testing grain that it may be by a quantity of not less than half a bushel." Referred to the Committee on Legislation.

The Chairman of the Committee on Credentials, Mr. Raynor, reported that there were 134 members present at the initial meeting, which he considered a very fair attendance indeed, considering the fact that the annual meetings of the Patrons of Industry were being held all over the province that day. On motion the report was accepted.

Prohibition. Moved by Mr. Hoar, "That in consideration of the result of the plebiscite vote taken in reference to prohibition last January; and whereas there is before a committee of this Central Farmers' Institute assembled a resolution referring to this subject; and whereas a Prohibition Convention composed of the foremost temperance workers of our province is now in session in this city; and whereas by the action of that convention the report of a delegation appointed to interview the Ontario Legislature to-day is expected to be given this evening, therefore it is resolved that when this meeting adjourns it stands adjourned until 9 o'clock to-morrow morning."

A Member: As we have two full days yet to discuss matters relating to the Institute, for the sake of attending the meeting in the Pavilion to-night I second the resolution.

Mr. Kennedy: I hold that we as farmers assembled here to-day should not allow our interests to give way to any other interest. Our main purpose here is in the interests of agriculture, and I hold it would be beneath our dignity as farmers to submit to any resolution that would be derogatory to the great interests we represent. I move that this meeting adjourns now to 7 o'clock to enable the committees to prepare their reports.

The Chairman: The reason of the dearth of work this afternoon is because of the absence of the President, and in the next place the Vice-President is also absent, and Mr. Mills as well.

Mr. Hoar: I am a farmer, and in the interest of the farmer is my heart, but a brother over here rose up and opposed the adjournment till to-morrow morning because this was a farmers' meeting. Now, I would like to know if the temperance principle is not a farmers' principle? If half of us get drunk every other week, and a lot of our young sons are tempted, I would like to know if the temperance question is not most intimately connected with the farming interest? If it is not I yield to my brother, who severely turned and looked with his eye upon me because I moved this adjournment so as to hear the report of the temperance delegation. As farmers we are as ready to hear a Conservative as a Reformer and a whiskey sucker as well as a temperance man if he reason the case. And as the ablest men in the province are there, and that convention is provincial as well as ours, and I think it is important to adjourn this meeting until to-morrow to hear those men.

Mr. Kennedy: I am a delegate from the county of Dundas and I ask my friend if I am doing justice to the Institute there which is paying my expenses if I while away my time when I am here. If you have a temperance organization appoint your delegates and pay them, but I hold it is not right to adjourn this meeting to go away to another.

The motion to adjourn until 9 o'clock to-morrow morning was then put and lost.

Mr. Raynor: In order to facilitate matters the Committee on Legislation thought it wise to pass upon a few of these resolutions. One was the motion of Mr. McCrae as to the admission of Canadian cattle into the markets of Great Britain and the United States; the other was as to testing grain, the motion of Mr. Hill. I was informed simply to place these before you for further consideration. We deemed them worthy of your consideration, and that legislation was necessary in this behalf.

On motion of Mr. Kells, seconded by Mr. McCrae, the report of the Committee on Legislation as given by Mr. Raynor was adopted.

FIRST DAY—EVENING SESSION.

Business was resumed at 7 o'clock, Mr. McEwing in the chair.

Mr. Nicholas Awrey, M.P.P., being in the audience was invited to the platform.

REPORT OF COMMITTEE ON NEW BUSINESS.

The report of the Committee on New Business was then read by the chairman of the committee, Mr. A. P. McDougald.

Your Committee on New Business beg leave to report as follows :

1. With reference to the resolution of S. J. Hogarth, asking for a reduction of the number of delegates, we recommend that no action be taken, inasmuch as the constitution provides for the delegates from each local institute.

2. In reference to the resolution of William Linton *re* formulation of scheme for annihilation of scrub bulls, we recommend no action, believing that however desirable it might be to abolish the use of scrub bulls, we deem it inexpedient to interfere.

3. That in reference to the communication of Mr. Allen Pringle, we recommend that Mr. Pringle be invited to read his paper on "Apiculture and Agriculture at the World's Fair," this evening or to-morrow.

4. In reference to the resolution of John Stokes *re* sale of timber lands, we recommend that the resolution be discussed in open meeting.

5. That in reference to the resolution of Mr. Robert Watson, Jr., recommending candidates for Parliament, your committee are of opinion that inasmuch as there are organizations which have charged themselves with the carrying out of the objects of the resolution, we deem it inexpedient for this Institute to take any action in the matter.

Moved by Mr. KELLS, seconded by Mr. Clarkson, that the report be accepted and adopted. Carried.

The CHAIRMAN: Their report brings the matter down to two items, the first of which is the paper of Mr. Allen Pringle. I will now call on Mr Pringle, a gentleman who has acquitted himself most creditably both for himself and this province at the World's Fair.

APICULTURE AND AGRICULTURE AT THE WORLD'S FAIR.

Mr. ALLEN PRINGLE then read the following paper: Although I have used the two terms above with a conjunction between them, agriculture in its broad sense includes apiculture, as it includes horticulture and other cultures which involve directly or indirectly the culture of the soil. I had the honor and responsibility of representing one of these cultures, viz, bee culture, at the World's Fair in Chicago the past season; and I am here as delegate to represent the Ontario Bee-keepers' Association at this farmers' meeting. I, for one, am not ashamed, but rather proud, to acknowledge that I am a husbandman as well as apiarist. At the present time, when the farmers' sons as well as the daughters, and even old folks, are heading towards so-called respectability, that is, towards the towns and cities, it behooves us to do all in our power to elevate the calling and render it more enticing and attractive to the rising generation (more respectable if you will) as well as more profitable.

At the great Columbian Exposition, now a matter of history, agriculture stood in its place proudly prominent among the industries of the world—the first of all industries as it will be the last (unless, indeed science shall at length accomplish the feat of not only making man in the chemical laboratory without the aid of nature at all, but also the food wherewith to feed him, about all of which I have some doubts, albeit he would be a rash man who would venture to set any limits to science after beholding her marvellous achievements in Jackson Park). We are, however, quite safe, I think, in assuming for the present that the farmer instead of the chemist or scientist will continue to feed the world; and that agriculture has not only in all the past been the first and most important of all callings, but that it will so continue in the future till old mother earth reaches her dotage, and her physical body having grown cold, refuses any longer to "bring forth."

I have said that the products of the farmer stood conspicuous at the World's Fair. They did, and every true Canadian must feel proud that Ontario agriculture, and horticulture and apiculture, not only stood prominent in the presence of the world, but pre-eminently and proudly prominent. And it was creditable to the Exposition that the

greatest and noblest of all industries was neither put in a corner nor on a back seat at Jackson Park. The spacious agricultural building, superbly classic in architectural beauty and design, with its magnificent Corinthian columns and splendid pavilions, substantially appearing withal, this was the fit rendezvous for the agricultural products and the yeomen of the earth. And the Horticultural building, though a thousand times more beautiful in its treasures within than in its mere structure without, was the fit repository for the luscious and beautiful fruit and flora from the four quarters of the earth—a display contributed so largely by this fair and beautiful Province. The worthy Secretary of this Institute had ample reason to leave the Horticultural Building a proud man, just as the Superintendent of the apiarian exhibit left the Agricultural Building. The President of this Institute also left Jackson Park in the best of spirits and filled to the brim with patriotic pride. He was always full of that, but it just bubbled up and ran over in the stock yards of Jackson Park as he raked in the awards for Ontario from the Yankees and the rest of the world—awards that were not merely parchments and medals, either leather or bronze, but hard yellow cash. He evidently feels good yet over it, and will, no doubt, for the rest of his life, and he has good reason to. I would not care to insure the life of any Canadian annexationist who might happen to run up against him after this.

And, gentlemen, still another man, one of ourselves, ought to be prouder than any of the results of his work for Ontario at the greatest of all expositions. I refer to the ex-president of this Institute, our chairman's predecessor, Mr N. Awrey, the World's Fair Commissioner for Ontario. Mr Awrey has filled the responsible and difficult position he was called upon to take with rare ability and brilliant success, and the members of this Institute in particular and the Province in general ought to be thankful to him for his very efficient services in their behalf. There is, indeed, reason for gratulation, and congratulation all round the Ontario Board; and one of the lessons the Canadians learned from the Yankees the past season in Jackson Park was how properly to blow their own trumpets both for themselves and their country. Nobody on earth, as everybody knows, can equal Uncle Sam's subjects in that rare accomplishment, and I noticed that the Canadians over there "caught on" nicely in the art of trumpeting, which however, was perfectly justifiable under the circumstances seeing that they had such good reason. Why, man alive! there was the greatest cheese on earth, the best stock and grain on earth, and the sweetest honey on earth, to say nothing of the fruit and flowers, and the monster squash—all from Canada—that God-forsaken and desolate region of eternal ice and snow! But, so far as Ontario is concerned, the hypothetical and everlasting ice and snow of Canada melted at last before the eyes of the world at the great Columbian Exposition. The Agricultural Building and Horticultural Building settled that fiction once and for all in Brother Jonathan's pate, John Bull's pate and every other foreign pate. Nobody will venture to say or think after this that Canada is not a land flowing with milk and honey of the very best quality; or that Ontario is not mantled with a flora which, and which alone, can produce the unrivalled nectar which took the palm from all nations. This, gentlemen, is neither hyperbole, romance or mere enthusiasm, but substantial fact. Canada produces as good, if not the best cheese in the world; Ontario produces the best honey in the world, and fruit which can compare in quality with any other from anywhere. I need not do more than thus briefly refer to Ontario's horticultural, dairy and stock achievements at Chicago. That will doubtless come from others if you were not already advised of the facts. But I must refer to the triumphs in my own special department. It has now been demonstrated to the world on two occasions that Ontario produces the finest quality of honey this earth affords. First, at the Intercolonial Exhibition held in London, England, a few years ago, where we exhibited many tons of Ontario honey, and now the past season at the greatest of all World's Fairs has the fact been demonstrated. About thirty five countries and dependencies, including a dozen or more States of the Union, made apiarian exhibits at Jackson Park, and none of them had honey at all approaching ours in quality or appearance except some from three or four States and Great Britain. The awards furnish the best evidence of this. Ontario took 17 apiarian awards, no other province making an exhibit, and while two or three of the American States had each twice as much honey on exhibition as Ontario we took twice as many awards as the highest of them and five or six times as many as the rest.

The judge being an American, though competent and honest, we, of course, got no more than our due. Our honey also stood higher in the American market than the native product and I sold it at a higher price, netting the Ontario exhibitors, after paying expenses of duty, etc, more than they expected and more in some cases than they could have realized at home. I found to my surprise at Chicago that there is much adulteration of extracted honey over there, not by the producers but by dealers, and there is such a widespread suspicion of adulteration among the consumers that they are reluctant to buy extracted honey out of the shops at all. Fortunately for us there is little or no adulteration in Canada, and hence our honey stands high abroad as well as at home. The honey, the dairy products, the live stock, the cereals, the horticultural products, the minerals, the manufactures, the machinery, the timber, the arts, the educational facilities and achievements of Canada are now advertised to the world as they never were before, and are now for the first time known to the world, especially to our nearest neighbour, as they were never known before ; and this is one of the valuable results of the great exposition to the Dominion of Canada.

But Canada can raise something else besides bread and butter and honey and cheese and animals, important as these are ; she can raise with a remarkable degree of success that other commodity sometimes called the "higher animal," viz., the *genus homo*. The same climate and the same Anglo-Saxon, Celtic, and Teutonic denizens so well adapted to raising the former are equally well, if not better, adapted to producing the latter, and they are accordingly produced. Our neighbors across the line unwittingly if not unwillingly pay tribute to our greatness in this regard by promptly placing our sons and daughters who go over there in place and position in preference not only to all other foreigners but to native Americans as well. The Canadian is found to be intelligent, strong, industrious, persistent and trustworthy, and hence his success abroad as well as at home.

As for the Canadian staff at the World's Fair, I may be pardoned for saying here (not because I was one of them) that they got the credit, I think, of being the most efficient, most exemplary in conduct, and most persistent in looking after their country's interests and rights—after number one if you please—of any staff of officials from any other country.

Moved by Mr. McDougald, seconded by Mr. Stewart, that the thanks of the Institute be tendered Mr. Pringle for the able and interesting paper which he has now read. Carried.

SALE OF TIMBER LIMITS.

The motion of Mr. Stokes *re* timber limits was then discussed, as follows :

Mr Stokes : I would say in the beginning that my object in bringing in this resolution is to benefit a great many farmers as well as myself. I have no desire to find fault with the Government as regards timber limits, but we have in the section of country in which I live, the county of Hastings, a good many saw mills, and the owners of these mills cannot get limits from the Government, and the consequence is we are put to a great disadvantage in getting lumber to improve our farms by buildings. We are at the mercy of monopolies—those big mills—and we have to buy our lumber and pay a high price and then pay railroad freight ; whereas if the local mill owners could get limits we could get lumber at a reasonable rate.

A Member : Are there limits in that part of the country yet unsold ?

Mr. Stokes : Yes ; our county reaches about 100 miles from north to south ; we have good streams to float logs down, but they all go to Trenton and Deseronto and we are left out in the cold.

Mr. Beam : I would ask Mr. Awrey what sized limits have been sold ; anything less than a township at a time ?

Mr. Awrey : Oh, yes ; it all depends on the character of the country and the character of the timber.

Mr. Beam : Are there difficulties in the way of dividing up these limits into smaller areas ?

Mr. AWREY: I don't know that there would be any great difficulty in dividing them into townships or even a mile square. But I have very grave doubts as to whether the farmers would derive any advantage at all if the suggestion were carried out. For example, if the Government to-day were to place upon the market ten townships with limits a mile square, that is 640 acres, you can readily understand that these very large, wealthy corporations would at once when they are put up at auction bid them up to enormous prices, and the small mill owners would not get them anyway. I don't know that it would be any disadvantage to try it; I believe that the Province might get even a larger amount per square mile than they do now, although I am doubtful whether the ultimate results would be any better for the small mill owners.

Mr. BEAM: I have had some experience with timber men, and I know a number who would like to purchase small areas but who are not able to undertake these large tracts as offered; and it seems to be an advisable change to adopt this resolution if it is possible.

Mr. GOODWILLIE: I would like to ask Mr. Awrey what the custom is in regard to selling these timber limits, is it spot cash or is it so much as the timber is removed? If it be that way, why then small mill owners have just as good a chance to-day as the large ones.

Mr. AWREY: The method adopted is this: It is put up at auction and sold at so much per square mile for the privilege of cutting the timber. That is the first thing with the lumberman when he buys at a sale. Supposing there are ten square miles, he pays from $1,000 to $6,000 a mile for the privilege of cutting the timber; that is cash. In addition to that he pays a bonus of $1 per thousand feet. That is paid when he takes the timber off. I may buy a timber limit of ten square miles and I pay $1,600 or $6,000 a square mile, that is $60,000 cash. I can leave it 20 years if I like, but it is at my risk, and the moment I commence to cut it each log is measured and the timber dues are $1 per thousand feet. The bonus is cash, but if you are a man that gives security you pay 7 per cent. interest. The bonus is the smallest part after all of the limit. Although you pay when you buy the limit at so much per square mile, that is only for the privilege of cutting. You pay cash for that, and if there is 100,000 square feet on an acre you pay $100 in addition.

Mr. BEAM: What security is taken—just the limits?

Mr. AWREY: No, most of the lumbermen pay cash; it never runs more than a year. They have got to have a marked cheque or credit in the bank or good security, and then they pay 7 per cent. interest.

Mr. CLARKSON: We might possibly agree that it would be more convenient for the farmer to obtain his lumber in case this system was adopted, but it is a question in my mind whether it would be any cheaper for them or not. It is a question whether lumber could be produced any cheaper in that way than it is produced at the present time, and I feel quite satisfied that the cost to the Government of surveying and of collecting their timber dues would be enormously increased in that way, as there would be a greater number of individuals to deal with.

Mr. GOODWILLIE: I would like Mr. Awrey's opinion as to the amount realized by the Government in selling it in small or large quantities. It seems to me if we would realize no more we might as well let it go as it is, because it is just about as broad as it is long.

Mr. HISLOP: Are those men who measure the lumber appointed by the Government?

Mr. AWREY: They are appointed by the Government and the Government pays them. The other question is rather a difficult one for a man to answer. If it is in a territory that the Government has already surveyed into townships and sections, as a great many of them are, the same as our old townships here, and they are surveying them as fast as they can, the difficulty that my friend spoke about would be overcome. I think they would get just as much money, in fact I think they would get more. The

large lumbermen certainly would object as business men, although I don't think they have a right to, to have twenty men dabbling in the timber where they want a limit, and the result would be they would go to the auction, and if a small lumberman was trying to buy—and practically a mile square is all one of our small mill-owners wants—the large lumberman would say, "I can afford to buy that and pay twice what it is worth rather than have this man taking any of this limit" I think we would get as much money, but I don't think the small mill-owners would derive the least advantage from it, and I am doubtful whether the people would get the lumber as cheap as they do now.

Mr. PRINGLE: I think the large dealers ought to be headed off in that. There is no doubt at all the large dealers would outbid the small owners and take the whole if they got the opportunity. I live in a section where the same trouble exists that the mover of the resolution speaks about; that is the headquarters of one of the great lumber firms of Ontario, and I think they could be headed off in this way; and it is the duty of the Government to do it. If any mill-owner applies to the Government for a mile square of timber limits, the Government ought to sell him that at any time at the average price that they have been receiving from the large dealers or monopolists,—if we choose to call them that,—and these monopolists would have no opportunity of coming in and heading them all out.

Mr. FISHER: What proportion of Ontario is interested, and to what extent? It is a question of finances I think we may very safely leave with the Government. Certainly none of the older portions of the province would derive any such benefit as the newer portions.

Mr. HILL: There are no two square miles that would average the same amount of timber, and if the Government sold them at the usual price, under those circumstances one would be a gainer and the other a loser.

Mr. PRINGLE: I did not mean an indiscriminate price for every square mile.

Mr. HUTTON: I like the spirit of the resolution. It seems to me is is aimed at monopolists, and that as farmers we ought to support it. I don't think there can be any harm done to the country at large or to individuals by the passing of this resolution, and we ought to give the men a chance if there is a grievance in that way.

Mr. HANLEY: As the seconder of that resolution I may say I have seen an instance in my own neighborhood this past season where a contractor found it impossible to get a certain kind of lumber although there was plenty of it in the country. He tried the mills at Deseronto and Trenton and then went to Ottawa and he found that all the lumber that they had of the kind he wished to get had been contracted for to go to foreign countries; whereas if the mill owners—and we have several of them in our locality—could have got the limits to supply farmers in the neighborhood he could easily have got it at home. My experience is for the past few years that if these local mills could get material to make lumber of we could buy it a good deal cheaper.

Mr. MAHON: I fully agree with the spirit of the resolution. I am altogether opposed, and I think the spirit of the people of the country is opposed, to the sale of timber or any other public property belonging to the province in such a manner as that it can be controlled exclusively by men of very large means; and while the policy of the Government with regard to the sale of their timber limits I believe on the whole has been wise and the trust has been well administered, yet I think it is a mistake if they don't sell a portion, at least in such places as there are small mills, in such a way that the people of moderate means could at least have a chance of bidding for them. If it should turn out that the wealthy corporations would pay a great deal more than a limit is worth there could be no harm done at least to the province by their doing so. and no harm done to the small mill owner who failed to be able to pay the price that they were willing to pay. So that I think it is a perfectly safe experiment, and I think it is well with the province of this nstitute as a representative farmer body to pronounce an opinion in that respect, and sincerely hope and believe that they will pass that resolution.

Mr. AWREY: I am doubtful whether the Government would object at all to selling a number of small limits, but I want you to remember the proposition of Mr. Pringle

places a wonderful power in the hands of a corrupt Government. If it be placed in the hands of Government to sell limits to everybody who asks for them at a price fixed by themselves, it places the temptation in the hands of politicians to influence a great many men. I am not going to say that either party would do that, but you must remember you are placing a vast amount of power in the hands of an executive. And if they are sold by public auction I can see no way you can prevent any man who sees fit to bid from buying. You must remember there is considerable discussion in the country at the present time regarding selling our timber limits at all; but I am certain that if the farmers' institutes of this province said to the Government, "We desire you to parcel out the timber lands of this province in small enough limits that mill owners can purchase it," they would do so. But remember if you place upon them the responsibility that Mr. Pringle proposes, you place them in the position of using it for political purposes; it leaves the Government open to the charge of selling timber limits for political purposes. Say twenty men go to the Government, and each says, "You give me a mile square." The Government says, "Well, we have been selling timber limits down there at $600 a square mile, you can have it at that" It may be that that limit is worth to-day $1,200 per square mile. It places the Government in the postion of some man saying. "Let him have it at the usual price, and he will be a political friend of yours." It places every man who applies at the mercy of the Government to force payment. I think you can trust the Government, but there are quite a number in this room who don't think they can, so you must be very careful about what you do.

Mr. GEORGE A. AYLESWORTH, Newburgh, Addington Co.: I come from one of the older sections, the Bay of Quinte district, and I know that what these men have said about what we suffer from the monopolies applies to that whole section of the country. As to the remarks that have just fallen from our ex-president with regard to the trustworthiness of the Government and the great power placed in the hands of a corrupt Government, he seems to have forgotten that the farmers of this fair province, who have been told repeatedly to-day that they are honest as well as sturdy, appear to have taken a notion their heads that they are going to run this country for some time altogether!

Mr. CLINTON: I think the resolution is all right as far as it goes, that is to divide the timber limits into small sections and let them sell it to the highest bidder at auction, and I think when we have gone as far as that, we have gone as far as we should go. As regards asking the Government to sell it to anybody at the old figure, I don't think we should do it I agree with Mr. Awrey as to that. I think it would be wise to pass the resolution as it was, asking the Government to divide the timber limits into smaller parcels, but I don't think it would be wise to ask them to value it themselves and give it to indivi- at a certain figure.

Mr. PRINGLE: I merely suggested that the Government should sell the limits at a fair average price. As to the monopolists outbidding the small owner, they could easily do that, because they could put it on the price of the lumber and make it twice as much as it is now; and they charge twice and three times as much now as we would have to pay if it came through the legitimate channels, through the small mills.

Mr. WOOLLEY: If I understand my friend over here, he would ask the Government if so many square miles were sold for so much last year, would not that be a fair valuation? Now take the illustration of wheat. At one time it may be worth 10 shillings a bushel and another time it may be worth 55 or 60 cents; or take eggs or anything of that kind. I think it would be only fair to put it up in competition, but I heartily concur with its going up in small lots, and if they can't bid on that why let it go to the highest bidder; but never say because you sold 640 acres last year for $6,000, therefore you should sell it at the same price next year. It would place a tremendous temptation in their hands, and some of us around Simcoe know too well how that has been used.

Mr. PRINGLE: Would my friend just answer this question? If it was fair to sell last year to a monopolist 640 square miles at a certain price is it not fair to sell this year to a private citizen, a mill owner, a smaller quantity at the same price?

Mr. WOOLLEY: If it was fair to sell wheat for 70 cents last year is it fair to do so this year? I can't get it.

Mr. PRINGLE: The monopolists are ready to bid the highest price in order to choke off the small dealers. There is actually no rise, but they are willing to pay an exorbitant price because they know they can get it all back.

Mr. STRACHAN: It is quite possible that selling small limits would be better for the country in that immediate neighborhood; at the same time I could not agree that it would be better to sell at a fair average price. The timber limits belong to the whole province, and people in that vicinity might get an advantage over other parts. I think timber limits should be sold to bring the most money for the whole province, and I believe the Government has been doing that. I do not say but that the small limits would be best but we should not encourage any special legislation of that kind.

Mr. BYERS: I would like to ask whether they have any guarantee that the small mill owners would not ask as high a price for that lumber provided they get these limits as what these monopolists now do. I have lived all my life within two miles of a large lumber company, and my experience, as far as it goes, proves that these small dealers just regulate their prices by those of the larger manufacturer; and I don't think if this motion were brought before the Government it would be of any use to the farmers. We have to be governed by the market; if the large dealer can get a large price for his lumber the small dealer wants the same.

Mr. DANCE: I think all over the country human nature is about the same; there is a desire to sell always at the highest price, and I think the small mill owners will put their prices as near to those of the large man as they can. When we are doing business for the public there appears to be no way in which we can satisfy the public other than by putting up anything of that kind for public competition.

MR. HANLEY: In regard to the price, the small mill owners have not the market, the foreign connections or the shipping facilities of the large dealers, and consequently they must sell cheaper.

Mr. HISLOP: The object of any man purchasing a timber limit is to make money out of it. Now the larger the limit you sell the greater opportunity you are giving the rich man to accumulate wealth, and it is monopoly we are fighting against. The wealth of this country is in the hands of too few people as it is now, and to sell these timber limits in large blocks is going to intensify the evils under which we are laboring, so I think it would be a step in the right direction to divide these limits up so that any man of limited capital would have an opportunity of competing with the rich man. If the rich man feels inclined to give more for a small limit than it is worth simply to drive the poor man out of the country he will charge just as much for his lumber whether he buys that limit for $6,000 or $24,000, and he will exact the last cent that the market will allow him to take, so that there will be no benefit derived from selling the timber in large limits. I believe that the more men you can get to take hold of these limits the keener the competition would be and the cheaper the lumber would be. Now as to the Government selling the limits at a valuation, I don't think that would work. I am a Grit, and I have all faith in the Mowat Government, but I would not like to entrust them, honest as they may be, with any such privilege. No matter how honest a man is, if he gives a man a timber limit he will be accused of valuing it to suit the man who is applying for it. The value cannot be determined in any other way than by open competition, and if you do away with that you are only going to fasten the yoke of monopoly more tightly on you than ever it has been before.

Mr. PRINGLE: I simply say that when a mill owner or any other private citizen applies to the Government between the times of sale, or any other time, for a mile or two miles of limits, that the Government ought to sell him that at a fair price. Let them hold their auction sales as usual and sell large limits if they choose, but I claim the mill owner ought to get his at any other time at a fair price.

It was then moved in amendment by THOMAS STRACHAN, seconded by WILLIAM BARNES, "That the Government of Ontario be recommended to sell timber limits, which are the property of the Province, in such manner as would bring the most revenue to the Province."

Mr. KELLS: I think the best course for this Institute to pursue is to take no action. We are here as agriculturists, not as lumbermen, and I don't think we have any business whatever to either recommend or in any way interfere with the Government as to their policy with regard to timber limits.

The amendment was then put and lost, and the original motion of Mr. Stokes was carried.

REPORT OF COMMITTEE ON LEGISLATION.

Mr. RAYNOR, Chairman of the Committee on Legislation, then read the following report of that committee:

3. In regard to the motion of Mr. N. J. Clinton, regarding the appointment of a committee to join with a delegation from Manitoba in memorializing the Government with respect to the duty on certain commodities, we recommend that a committee of three be appointed to act on behalf of this Central Farmers' Institute with any delegation coming from Manitoba or the North-west advocating before the Government the reduction of duties bearing heavily upon the farmers of Canada.

4. As to the question of doing away with statute labor, we recommend that it be considered with the discussion on the paper which is to be read on Road Improvement.

5. With regard to the motion of Mr. Hislop re free trade, we recommend that the matter be discussed along with Mr. McEwing's paper.

6. With regard to the motion of Mr. McFarlane re cumulative voting, we cannot recommend the adoption of this system of voting, but would request that Mr. McFarlane be allowed to speak in its behalf.

7. With regard to the motion of Mr. Fraser re superannuations and pensions, we recommend that it be considered and reported after the reading of Mr. McEwing's paper.

8. With regard to Mr. D. E. Smith's motion relative to the prohibition of the liquor traffic, we recommend that this be adopted.

Moved by Mr. RAYNOR, seconded by Mr. KELLS that the report be adopted.

Moved in amendment by Mr. CLARKSON, seconded by Mr FLEMING, that it be considered clause by clause. Carried.

Clause No. 3, the motion of Mr. Clinton re the appointment of a committee to join with a delegation from Manitoba in memorializing the Government respecting the reduction of certain duties, was then taken up.

Mr. KELLS: I think this question should be discussed; it means money. Exception has been taken here to the money spent in sending a deputation to interview the Dominion Government regarding the reduction of the tariff in different lines, and besides, the resolution does not state what articles they want a reduction on. I think the whole thing is unsound, and we should not interfere with it in the present shape.

Mr. RAYNOR: I may say that we considered that point, and we thought it was not wise to specify any particular articles; but we put it in this way—the duties which bear most heavily upon the farmers of Canada.

Mr. MCCRAE: They have asked us to assist them in getting a reduction of the duties on articles bearing upon the farmers. Now, we are here as farmers, but we are only the farmers of Ontario, and if there are other Provinces in this Dominion working along the same lines with us, even if we do spend a little money to help them in their work, we are helping ourselves at the same time, and I think in that way the resolution should be passed.

The motion to adopt the clause was then put and carried.

Clause No. 4, the motion of Mr. J. C. Hanley, that the C F. I. recommend that the Government of Ontario, at its next Session, introduce an Act providing for the total abolition of statute labor in municipalities settled for 50 years or upwards, was then considered.

Mr. McCrae: There is a paper to be read on the subject of roads, and we may as well discuss the whole matter at once.

The report as to clause No. 4 was then adopted.

Clause No. 5, as to free trade The committee's report was adopted.

Clause No. 6, as to the motion of Mr. McFarlane, *re* cumulative voting, was adopted.

FARMERS' INSTITUTE.

Mr. McFarlane then read the following paper relating to the matter:

Some of the avowed objects of the members of the Farmers' Institute are to seek to try to obtain remedies for grievances especially affecting the farmers.

Agriculture is the chief business of the larger part of our population in Ontario, and occupation of farmers is now, from various causes, in a very depressed and unsatisfactory state. This depression and the consequent shrinkage in the value of farms and of farming property may in part, though not in whole, I think, arise from unsuitableness in our municipal law, which does not secure to the owner or ratepayer the full and the fair control of the property he has by skill, industry and frugality acquired, and for which rates are yearly exacted from him for the management thereof and for the purposes of Government.

That an available remedy, to some extent, for this cause of depression in the value of farmers' property could be practically found in a suitable change in the Municipal Law, which change would secure to the farmer full and fair power to elect or appoint the managers of the mutual property, that is to say, to elect the members of the township and county councils, such fair and suitable election to be made by the owners, and hence ratepayers only, and each such voter to have cumulative vote in proportion to his paid taxes for the previous year, and to include all, even to the lowest taxyayer, one dollar of paid taxes to be the unit of such elector's cumulative votes.

The fairness, suitableness and success of this plan of management by owners only is proved by the large number of thriving joint stock concerns now doing business among us, that have adopted and steadfastly use this plan.

Now this plan which I propose, if fully adopted, will influence the whole farming property in Ontario, now said to amount to $1,000,000,000, which sum is more than double all the stock held by all our other joint stock companies.

To show the unfairness to the farmer of the Municipal Law as it now exists, I will give a short detail of a case in point.

In 1892 the number of ratepayers in a certain township was 764, and same year the number of names of voters on the Voters' List was 1,323, showing a difference of 559 voters who owned no part of the township property and hence paid no part of the township rates and yet, who, by law, help to vote in the managers of the township property, that is the township council, which levies, collects and expends in part the township rates and funds, all which by the auditors' report for same year in that township amounted to about $52,000.

Of this 1,323 voters, the list showed that there were then 542, rightly or wrongly, selected by the proper officials as qualified for jurors, conclusively showing a vast amount of illiterate, undesirable voters, in that township, notwithstanding our excellent school system.

Clause No. 7, the motion of Mr. Fraser *re* superannuations and pensions. The report of the committee was adopted.

Clause No. 8, regarding prohibition. The report of the Committee was adopted.

The motion of J. HILL, seconded by H. GOODWILLIE, re testing grain was then discussed.

Mr. GOODWILLIE: All farmers are aware of the method that has been adopted in testing grain: that is with a little bit of a pint or quart measure as the case may be, and it is a very unjust thing to the farming community. It has been proved by testing that grain will vary, and a farmer will lose two to three pounds per bushel in that way; therefore we think the measure should be enlarged.

Mr. HILL: I have had some experience in that, and in one case it tested three pounds less than the actual weight. Now, the farmers have no objection to the grain being tested; it is only justice to the miller that it should be tested and light wheat that won't weigh more than 54 or 56 pounds per bushel, is certainly not worth as much as wheat that will weigh 63 or 64 pounds, but at the same time we want justice.

The CHAIRMAN: Provision has already been made in the statute for that. I am under the impression this matter was threshed out here some few years ago, and there was action taken along that line by making it optional with the seller having his grain tested by the half bushel measure or the present measure, and I believe such is the law at the present time. So that if that is the case I think the gentlemen will be quite willing to withdraw their motion.

Mr. GOODWILLIE: Yes; I am quite willing.

A MEMBER: The grain tester has been out of existence since 1889. I got a notice to that effect from Ottawa, that the Order in Council passed in 1886 was cancelled in 1889. It is said that the grain tester had ceased to be a legal arbiter as between buyer and seller though it was not the intention of the Government to stop millers and merchants using it in warehouses for their own information.

Mr. RENNIE: I am rather surprised to hear that. If he sells grain in the City of Toronto here whether it goes to the mills or the wharf it is tested in one of those small testers. We have been drawing wheat of late and I know it to be a fact.

The CHAIRMAN: I think you have already got what you are asking for as far as the Government is able to give it to you. If you sell standard grain of a certain weight for a certain price you can demand that that grain be tested by a half bushel measure. I think this discussion is out of order as the matter was withdrawn.

The CHAIRMAN: I think this would be the proper time to appoint the committee spoken of in clause 3.

Mr. HANLEY: I beg to suggest in connection with that that the deputation should take up all the questions and do all the work required to be done at Ottawa.

Mr. GEORGE A. AYLESWORTH: I beg to move that that committee consist of the President to be elected for this year, the Vice-President and the Secretary. Those are the three most important officers, I think, in connection with this or any other similar organization, and it cannot be a personal matter just now as we don't know who these men will be.

Mr. DANIEL WOOLLEY: I second that motion.

The CHAIRMAN: It has been moved and seconded that the committee be composed of the President, Vice-President and Secretary-Treasurer, and that that committee present all matters which it is desired by this Institute to have presented to the Government. Carried.

Mr. MCCRAE: As to the election of officers I see there is some change in the mode of election, and this order paper also refers to a certain page in last year's report, but on turning to that page I find there is nothing about it.

The SECRETARY: The year before last it was by ballot, and last year it was moved by Mr. Clarkson, seconded by Mr. Longmore, "That the resolution passed last year res

pecting the mode of electing officers in so far as it relates to the election of the candidates for the offices of President, Vice-President, Secretary-Treasurer and Auditors be rescinded." Carried. That is on page 62 of the last annual report. All the officers then will be elected by open vote except the Executive Committee, who are elected by districts.

Mr. BEAM, on the invitation of the Chairman, then sang a song, which was heartily appreciated, after which the meeting adjourned.

SECOND DAY—MORNING SESSION.

Business was resumed at 10 o'clock, Mr. McEwing in the chair.

Noxious Weeds. Moved by E. HAWTHORNE, seconded by H. E. GARBUTT, "That, whereas it is a lamentable fact that this fair province of ours is menaced by a formidable array of noxious weeds, and they are allowed to get a permanent foothold in many of our best farming districts through ignorance, it is hereby resolved that we, the delegates to this Central Farmers' Institute, urge upon the Legislature of Ontario the placing of colored engravings of the principal noxious weeds in each post office throughout the province, and thus assist those who are anxious to keep their farms clean by becoming acquainted with their enemies." Referred to the Committee on New Business.

Registration of Deeds. The following motion from the East Lambton Farmers' Institute was read by Mr. HUNTER: Moved by JAMES MCLEAN, seconded by RICHARD STUTT, "That our delegate to the Central Farmers' Institute will bring before that body the advisability of introducing the Torrens system or Land Titles Act instead of the present expensive system for the registration of deeds and mortgages in this province." Referred to the Committee on Legislation.

French Treaty. Moved by N. J. CLINTON, seconded by T. S. HENDERSON, "That we, the members of the Central Farmers' Institute in meeting assembled, do hereby express our appreciation of the Dominion Government's action in deferring the confirmation of the French treaty; and as we do not consider said treaty would be to the best interests of this country if put in operation we humbly petition your honorable body not to ratify said treaty." Referred to the Committee on Legislation.

Mr. CLINTON: If it is according to the constitution, would it not be wise to appoint a nominating committee, selected by the President, to bring in names to fill these offices, and we could either adopt the report or change it? Some gentlemen may nominate somebody for president and some other gentlemen rather than give him any opposition would not nominate anybody else.

Mr STEWART: I don't think it would work very well. The President might nominate a Committee that would nominate his own friends.

The CHAIRMAN: I think Mr. Stewart's suggestion is a good one; I would decidedly object to nominate a committee for that purpose if I were president. I object to the principle of it.

Mr BOWES has placed a paper in my hand which has been prepared by him for your advantage at this meeting. It is entitled "Farming Interests as one of the Divisions of Labor." I will refer this to the Committee on New Business.

Mr. CLINTON: I move that a committee of five be elected out of this meeting, and they adjourn at once and bring in a report as to nominations for our officers.

Mr. PRINGLE: I beg to move in amendment that we proceed by open vote according to the constitution.

Mr. KELLS: I consider this unconstitutional and out of order altogether; there should be a motion amending the constitution.

A MEMBER: The resolution of Mr. Clinton, while it may be advisable, is certainly out of order, and if it is advisable to change the constitution do it in the right way. Our rules say decidedly what we must do and let us do it.

Mr. CLINTON's motion was then put and lost.

ELECTION OF OFFICERS

The election of officers was then proceeded with, the result of which is given on page VI of this report.

Mr. McCRAE: On the matter of this Executive Committee I want to say that I think the Executive Committee ought to be delegates from the different associations. It may be the custom in the past that they came here without any credentials at all by right of being on the Executive Committee, but I think that ought to be modified; that they ought to come as delegates from their several associations and should be paid by those associations. I notice that they draw their pay here from the Central Institute though they come without any credentials.

Mr. GEORGE A. AYLESWORTH: There is a large grant placed at the disposal of the Central Institute by the Government, and what better can be done with it than by paying the legitimate travelling expenses of these men who undertake to carry out to the satisfaction of the Institute the onerous duties that are laid upon them? These men ought not to pay their own expenses, nor their expenses ought not to be thrown back on the local institutes that send them here.

Mr. McCRAE: I don't object to any legitimate travelling expenses of gentlemen being sent down to Ottawa provided they do anything when they go down, but I do object to gentlemen going down there and coming back with their finger in their mouth without doing anything. And I do think that when they went down there and could not see the members of the Government that they might have come home and reported what they could not do, and I blame them for our meeting yesterday. I think we should not have been sitting here all afternoon trying to get resolutions to put before the chair to occupy the meeting. Any gentlemen here who were business men know it was not conducted in a business way. Now, what have we to show for the travelling expenses paid by this Institute last year? I think that this meeting ought to have the best talent that there is in the world before us as farmers. I think we should not discuss timber matters and legislation matters and matters of tariff and things of that kind so much. These are all cognate subjects it may be to the farmers' interests, but I say that this Institute ought to arrange in such a way that we can hear the best results obtained in farming lines in every part of the world. Are we getting the information we want? There are many able men on the other side, and I think it would do us a little good if we could get the very best men in the world to come here and teach us something about farming and something about what is being done in the farming world instead of the talk we had here yesterday afternoon.

The PRESIDENT: I would just say as a member of that Executive Committee, and as a member of that delegation, that went to Ottawa, a certain amount of that blame being thrown upon me, and also as to the object with which this meeting congregates here, that my own individual opinion is this, that it is something larger and broader than a matter of cultivation of the soil. We have local institutes for that purpose. And talking about able men on the other side that we ought to bring over here, I think the results of the Columbian Exhibition show very conclusively that we have better men here. About the dearth of material before this meeting yesterday, I think that Mr. McCrae is entirely astray. There was a large amount of business transacted that we had been in the habit of being bothered with during every session of our usual meeting, and yesterday we disposed of everything of that nature, and disposed of it very satisfactorily apparently, so now we are in a position to go on with the legitimate business for which we are met. I think it was better to get rid of this froth, so to speak, yesterday at our first session. Then, too, our President and Vice-president were both absent, but I don't think our time was altogether wasted even in the manner in which we conducted the business yesterday. In regard to the members of the Executive Committee being delegates from their local institutes, the custom in the past has been for these men to come by virtue of their office, and the district institutes were entitled to send two representatives as well. If this meeting wishes to change that course well and

good; I do not think any person will feel at all aggrieved in the matter. But in regard to the deputation to Ottawa I will say this: We went by the instructions of this Institute. If we did not accomplish all we asked for it was not our fault; and if we used our best endeavors to succeed in what we had been instructed to carry out, I don't know that we are very deserving of blame. The only thing that I do feel a little aggrieved with myself about with regard to the matter is this: I think if the Government was not disposed to give some person authority to listen to the grievances which we, as the representitives of this influential body presented, I do feel that it would have been almost wise to have come home and made this province ring with the treatment which the deputation had received. I don't think we received as courteous treatment as we might have received, but opinions differ even in regard to that. On the whole I don't know that the Committee are so very deserving of censure as the address of Mr. McCrae might lead a person to suppose.

Mr. KELLS: There seems to be a very erroneous opinion as to the deputation going to Ottawa, and it is very unfair. I don't care what party I belong to, I give every Government, Provincial and Dominion, fair play. We were sent there as a deputation carrying this free trade resolution to the party that had charge of the Inland Revenue Department. We were received and heard there for an hour and a half, and if we had wanted to stay three hours we were welcome to stay. Every point was well considered, and they said they would take it into their most serious consideration. I would like to know what our Ministry in Ontario could do more than consider this matter? Could any gentleman present ask the Government to come in and pledge themselves to something right at that time? Then besides that we had other resolutions passed by this Board which had to come before the Minister of Agriculture, and the Minister of Agriculture waited upon us and was willing to wait on us long after we were done, and declared that we were worthy of being heard, and he preferred to hear a deputation from the Farmers' Institute to any other institute that was organized in this Province. The Government could do no more. Had we any business with the Attorney-General of the Dominion? We had no legal matters to bring up. Give public men fair play anyway. Though I oppose the Government of this province with my vote, yet I have been well received by them, by the Treasurer of this province, and he has used me very courteously; I have always been courteously used by these men, and why should we try to spread it abroad all over this country that the Government of this Dominion did not receive us fairly and squarely and considerately?

Lawful Roads. Moved by S. B. GORWILL, seconded by A. P. MCDOUGALD, "That the Provincial Legislature be memorialized asking that body to so amend the Municipal Act as to define what shall constitute a lawful road, and that no rural municipality be required to make the travelled portion of any road more than 24 feet in width." Referred to the Committee on legislation.

Executive Committee. Moved by THOMAS A. HOOD, seconded by D. MCCRAE "That candidates for members of the Executive Committee must be certified delegates from the local institutes they represent to be eligible to the office, and that their expenses at their first meeting be paid by their own institutes; and that they will not have votes at next meeting unless delegates."

The CHAIRMAN: I think when the matter is up it would be better to have some definite ruling for our guidance in future.

The SECRETARY: The rule that is now submitted is the rule we have alaways had. A gentleman comes here as a delegate from his institute, and he is elected a member of the Executive Committee; he is then notified next year to appear at the opening meeting of the Executive Committee; he is elected again as a member of the Executive and acts as such.

Mr. STEWART: I move that that resolution be amended in this form, "That after that man has been elected as one of the Executive Board he must be re-elected as a delegate from the Institute before he has a voice in this meeting."

Mr. GEORGE A. AYLESWORTH: There are objections both to the original motion and also the amendment. It is the habit of local institutes to change their delegation re-

peatedly. The feeling is abroad, whether it is right or wrong, that one man ought not to have too much of a good thing and that new delegates should be sent up every year Now, if that resolution were to prevail it would work great mischief in the conduct of this Institute if carried out to the letter, because the one thing that is to be contended against most frequently in this Institute is that the delegates are not acquainted with each other till about the third day of the meeting, and if there are a few of the officers of the preceding year who are acquainted and know the run of the business it is a great advantage to have their services.

Mr Clarkson: Was there not passed by this Institute five years ago a resolution by which a member of the Executive Committee was entitled to all the privileges as a member of this Institute?

The President: Yes.

Mr. Clarkson: By that then a member of the Executive, although he be not chosen by his local institute as a delegate, is a member of this Institute and is eligible to any office in it. There is a difficulty that will arise in this way, you elect a man here as a representative of a district on the Executive and his institute neglects to return him as a delegate; he comes down at the annual meeting, he is entitled to all the privileges of this Institute by resolution, and he remains here, but who is going to pay his expenses? If you carry this resolution the local institute will be called upon to pay them. They may object and say: "We never sent that man, he is no representative of ours." He must then be paid by the Executive Committee. I think it is perfectly legitimate and proper that the Executive Committee should expend their money in that way.

Mr. Good: That resolution covers that very ground, that the first meeting shall be paid by the local institute; and if he comes here next year to attend the Executive meeting his expenses will be paid by the Central Institute

Mr. Beam. I have all due respect for my friend, Mr. McCrae, but I think this has not been thought out. Suppose the President, Vice President and Secretary come here, they are not sent here by the local institutes, consequently they are not eligible for re election, and there must be a new Board and everything every year. This Institute has ample funds and the local institutes have not. I think they should be eligible, some of them at least, so that there would not be new men every year.

A Member: Who selects this committee?

The President: This meeting.

A Member: Well, then we should pay for them

Mr. Stewart: It just simmers down to the question shall one county be allowed to send three men and another two? I have no objection to this Institute paying for the member of the Executive Committee, but let one riding have only two votes.

A Member: There is one thing about that that has not been mentioned; if you do not permit the officers of this Institute to have votes in the next ensuing Farmers' Institute you are placing them in a position where they cannot defend themselves, and I for one cannot endorse it.

The resolution was then put to the meeting and lost.

It being 12 o'clock the meeting adjourned.

SECOND DAY—AFTERNOON SESSION.

Business was resumed at 2 p m., the President in the chair.

The following telegram from the late Vice-President, Mr. D. M. Macpherson: "Lancaster, Ont.—I regret I cannot be with you. Wish your present meeting every success."

The Vice-President, Mr. Raynor then took the chair while the President, Mr. McEwing, read the following paper:

HOW CAN GOVERNMENTS BEST FURTHER THE INTERESTS OF THE AGRICULTURIST?

In a young and vigorous country such as this Canada of ours, a country of almost boundless area and immense capabilities for the further extension of the agricultural industry, a country in which the agricultural interests already overshadow all other industries combined, in the number of people to whom it gives employment, the amount of capital invested in the business, and the amount of national wealth annually produced, the question of how governments may best assist, encourage and extend an industry of such vital importance in the building up of a great nation upon the northern half of this continent is certainly a problem worthy of the attention and consideration of every patriotic Canadian who desires his country to attain that measure of prosperity most conducive to the growth of a great and powerful nation. Government assistance to the agricultural interests will of necessity be largely along the line of education and legislation. Education to enable those engaged in agricultural pursuits to attain the best possible results in producing the greatest amount of farm products of the best quality at the least possible cost. Legislation to secure the best possible market for such products; legislation to secure cheap and satisfactory transportation facilities for the conveying of these products from the producer to the consumer; legislation to lighten the burden of taxation now bearing heavily on the agricultural interests of the country; legislation to secure to the tiller of the soil the enjoyment of that which is the birthright of every free man—the right which should never be taken from a free citizen of a free country—the right to buy in the cheapest market and sell the fruits of his skill and labor in the dearest market.

We have established a national system of public schools for the education of the masses, it being an accepted axiom in this country that it is the duty of the state in the interests of the community at large to provide even the meanest and most lowly of its citizens with the means of obtaining a good, sound, practical education to make them better and more valuable members of the commonwealth. It is the duty of the Government to see that proper facilities are provided in the public schools for giving a good, sound, practical, business education—such an education as will be most likely to assist the citizen in conducting the business affairs of life. Thus equipped, every citizen would be more likely to acquit himself with credit to himself and honor to his country. It may be said that our school system already provides such an education. It may do so in towns and cities, where the public schools are supplemented with high schools, collegiate institutes and other institutions for higher education, but it is doubtful, very doubtful indeed, if the public schools in themselves are properly equipped for doing this work. Our educational system is a matter of national pride to us, and is a splendid system in theory, but the results are rather disappointing. Instead of giving a well-grounded, thorough education, one which is likely to be most useful in after life, it is one continuous system of cram for examinations. Almost from the time the pupil leaves the first form in the public school until leaving the university the same methods of cramming is pursued—superficial attainments acquired at high pressure speed, but accompanied by a deplorable lack of thoroughness.

The curriculum of the public school should be arranged so as to constitute a complete all round education as far as it goes, arranged so as to most largely assist and guide the pupils' studies in the direction which will be most useful in gaining an honest livelihood in after life. The public school is largely the farmer's school, being to a great extent the only school the majority of rural pupils ever attend, and such being the case they should be made as efficient as possible for the work necessarily devolving upon them. Much valuable time would also be gained to the pupils taking a course in the public schools if the summer vacation was for a term of two weeks instead of six weeks as at present The vacation occurs at the season most suitable for comparatively young pupils to attend the school, and it appears to be a wanton waste of valuable time to close the rural public schools for such a lengthened period. The aim and object of the public school should be something higher and better than to furnish a mere preparatory course for entrance to high schools and similar institutions.

Whilst fully recognizing the advantages of higher education and its necessity in the development of that broad and enlightened nationality so ardently desired by every true Canadian, yet such higher education should be more nearly the concern of the individual than the community.

Another line of education which might well receive more attention and assistance from the Government is in the direction of improved methods in agriculture. The present long-continued period of depression in agriculture, with wheat at close to 50 cents per bushel, the barley trade ruined by McKinleyism, the horse trade literally dead—killed by McKinleyism—and the general adoption of electricity as a motive power, has thoroughly demonstrated the necessity of an entire change of the methods and systems which have been followed heretofore in this country. To ascertain the best methods of agriculture to meet the new conditions, which now obtain, is likely to be a costly experience if left entirely to individual effort. This is a matter in which it would be national economy for the governments to take active and energetic measures to ascertain what those methods should be and to give practical demonstration of the results to be obtained by adopting such improved methods in agricultural operations. It may be said that the governments are already doing a good work along this line by aiding and assisting farmers' institutes, dairymen's, stock-breeders', fruit-growers' and other kindred associations, each and all of which associations are doing a grand work in furthering the interests of agriculture. The governments have also established costly and elaborate experimental stations and model farms in various parts of the country. Whilst good and most valuable work is being done at those stations, it is doubtful if those institutions are not only too expensive but also too extensive to give the best results as an example of the most improved and successful methods in agriculture, or as an object lesson to the ordinary farmer. There is certainly a wide gulf between the conditions which obtain at those stations and those which surround the ordinary farm—so wide indeed that it is almost hopeless to attempt to even throw a life line across to carry hope, aid and success to the farmer on the other side, heavily weighted with financial burdens, struggling manfully against heavy odds to acquit himself as an honest man and good citizen. Canadian agricultural products enter into competition with the products of nearly every agricultural country in the civilized world. Some of those competitors are possessed of immense areas of cheap, fertile lands, a more salubrious climate and an abundant supply of cheap labor, powerful factors in the production of agricultural products at a low cost. Having to compete with countries enjoying those advantages, it is necessary for the Canadian farmer to use more skill. Knowledge is power. This is as true in regard to agricultural operations as in anything else. A practical application of scientific knowledge in regard to agriculture is necessary to give the best results, and the best results should be aimed for. Canada has a large and growing trade in the export of agricultural products, hence the price obtainable by the producers for those products depends largely upon the demand for and prices given for such products in foreign markets. It is the duty of the Government to secure free entrance, by treaty or otherwise, to the best markets for the different products of the farm; nay more, it is the duty of the Government to even make some sacrifice if necessary to secure such markets. This is a plain statement of one of the fundamental principles of political economy, that all legislation should be in the direction of the greatest good to the greatest number. The Canadian farmer is suffering severely at the present time by being deprived of free entrance to the best markets for a large variety of the products of the farm. The Government should be strongly pressed to put forth every effort to have the embargo removed which is now bearing so heavily against the trade of the country. It would be largely in the interests of the agricultural interests of Canada if the Government would adopt a policy of free trade with Great Britain on British trade lines. If this course was followed, it would not only be a benefit in securing goods at less cost to the farmer, but it would enhance the price of that which he had to sell. He would secure better freight rates, as ships would be able to secure return cargoes; not only that, but it would be a mighty lever to remove the obstacles at present standing in the way of free entrance to the market to the south of us—so near yet so far away. Owing to keen competition and low prices, the question of the cost of transportation looms up largely in the matter of profit or loss to the producer. This is a subject which for some reason has not received that attention on the

part of Parliament and the Government which the immense interests involved would entitle it to. The Dominion Government, the Provincial Governments and the municipalities all over the country have literally poured out their millions of money to aid and assist in building railways for the transportation of their products. Many municipalities repeated that process for the sake of securing competing railways only to find that in a short time the competing roads were amalgamated under one management, and the expenditure, as far as the municipality was concerned, became a total loss. We have not only suffered heavy financial loss in this way, but in many instances our interests have been sacrificed to the requirements of our foreign competitors who never contributed one dollar towards the building of those railways. Time after time at critical periods when immediate shipment was required in making sales our warehouses have been filled to overflowing and the dealers unable to forward the grain to market. And why? Not because the railway company had not sufficient facilities to meet the requirements of the trade, but because they were using their rolling stock to move our competitors' grain to market, keenly competing for the American trade, and forwarding it a much greater distance at a less rate than they will carry ours, thereby inflicting great inconvenience and heavy loss upon the Canadian farmer. This condition of affairs is not as it should be, and it is high time that our Parliament and the Government from whom those railway companies received their charters should take some decisive action to protect the interests of Canadians who have contributed so largely towards the building of the railways, by abolishing these abuses and regulating the carrying trade of the country.

Another matter in which the Government might greatly assist the agricultural interests is in the matter of ocean freight rates. There appears to be a strong movement towards establishing what is called a fast ocean service across the Atlantic, and it is understood that the Government is offering a very large monetary consideration to secure such service. If it is a wise and statesmanlike action to expend large sums of money to secure a saving of a few hours at the best in passage of mails, passengers and high class freight across the Atlantic, there should be little difficulty in making out a good case for Government assistance in regard to ocean freight rates on the live stock export trade of the country. This trade a short time ago was a large, a growing, and a profitable trade to the country, but owing to a series of severe reverses it is now in anything but a satisfactory condition. The trade received the first serious blow when the authorities in Great Britain in their wisdom saw fit to schedule our cattle on account of pleuro-pneumonia. This embargo prohibited dealers from forwarding Canadian live cattle to the inland markets. According to the statements of Alderman Frankland, late of Toronto, who was largely engaged in the trade, this privilege was worth from $8 to $10 per head. To secure that advantage Canadian cattle had to be shipped *via* Montreal, as, owing to the presence of pleuro-pneumonia in the United States all cattle shipped from American ports had to be slaughtered at the port of disembarkation. Previous to Canadian cattle being scheduled by Great Britain a number of dealers occasionally forwarded their cattle *via* American ports having obtained so much better freight rates that they could afford to sacrifice the privilege of forwarding the live cattle to the inland markets. But, following closely upon the action of Great Britain in scheduling our cattle, came a similar move by the American Government prohibiting the shipment of Canadian cattle through American territory unless previously subjected to a 90 days' quarantine. This action of the American Government of necessity confines the live stock trade to shipment *via* Montreal, and unless some relief is obtained from the present adverse conditions, the excessive ocean freight charges is likely in the near future to almost entirely destroy this trade. The maintenance and development of a trade as valuable as the export trade in live stock promised to be is surely of sufficient importance to the country to merit the attention and assistance of the Government to preserve it from extinction.

It is generally conceded that Canada is rather over-much governed—that there are too many legislators and officials; the country swarms with them and the woods are full of them, ranging from pathmasters and pound-keepers to senators and governors, each drawing salary, fees or other emoluments as the case may be from the long suffering tax payer. The present system is upon a scale entirely too elaborate and costly for our

requirements. In fact it is more nearly commensurate with the requirements of a population of twenty five millions of people than that of five millions of people. If the Government would make a radical reduction in the legislation and official system of the country it would afford some measure of relief to the tax paying community. Commence with a clean sweep of that useless and effete body of political failures, the Senate. Abolish that swindle and fraud, the superannuation system. Cut off the extras in connection with the gubernatorial offices and establish the office on a basis of use instead of ornament to the Government mill. Reduce in size and remodel in form the numerous legislative bodies. Discharge all unnecessary deputies, clerks and other useless parasites now fattening upon the body politic. Reduce the salaries and fees of those in the public service to the same standard as similar service would bring in private employment. Reorganize every department of the public service on business principles, instead of that of political expediency, as is the case in many instances at the present time. Canadian legislators and Governments should thoroughly study the three great R's so necessary at the present time, namely, Reduction, Reorganization and Retrenchment—reduction in the number of legislators and other costly officials, reorganization of the public service so that the country would receive a fair day's work for a fair day's pay, and retrenchment in the public expenditure so as to lighten the burden of taxation now pressing so heavily upon the toiling masses, the chief amongst these is the tiller of the soil.

The CHAIRMAN: In submitting this matter for discussion I want to suggest that we take into consideration some of the advice of Mr. Awrey yesterday, that we talk to the point, that we keep our passions down, that we do not allow ourselves to be carried away by party prejudice, but to discuss these things on the broad lines of statesmanship, what is in the best interests of the masses. I think if we carry out these ideas when we get through this discussion we will have framed resolutions and we will have expressed our opinions upon these points contained in the paper in such a way that it will result in some good.

Mr. JAMES SMITH: I was much pleased with the sentiments contained in the paper just read. There was one particular matter to which he referred, which I think is a very important one, that is that higher education should be the business of those who profit by it. Now, our Government recognizes the principle that public school education is a necessity, and they justly, in accordance with that, demand that the public support it. They do not recognize the principle that the higher education is a necessity for the public, but they demand that the public shall support it. Now there is an injustice. It is an injustice to ask the public to support what is not a necessity, and we are at the present time paying very largely for the education of a certain class who look down upon us and say, "You are moss-backs, you are hayseeds," and so on, and I think it is time we were taking up this question and saying that we are not going to pay for indiscriminate higher education. We are placing a power in the hands of many who are unworthy of that power, and who will not use it to the advantage and in the interests of our country, so I say it is time that we take another stand and say, "Here, we are not going to support the high schools." We should petition our Legislature to commence at least by reducing the grants to higher education, to the high schools and universities. I have prepared a resolution dealing with the matter, but I suppose it will be out of order to read it till the question is discussed.

Mr. BOWES: I think it would be better to receive the resolution and dispose of it and then go on to something else.

The CHAIRMAN: I have no objection to his presenting the resolution at the present time.

Moved by JAMES SMITH, seconded by MARK WALKER, "That while this Institute values and recognizes the importance of our Government providing a means of obtaining a liberal education, and whilst we endorse the principle of compulsory support to our public schools, we claim that those who take advantage of a higher education should bear the expense of the same; and that we petition the Ontario Government to at least reduce the grants to facilitate higher education."

Mr. GEORGE A. AYLESWORTH: This is a subject which I cannot let go without remarking that it is not so plain as it appears that the resolution should be carried, and that we should approach the Ontario Government along those lines. Experience shows that it is impossible to have good public schools without good high schools. How are you going to get good public school teachers unless you afford facilities for their getting their education at a good secondary or high school? You cannot have good high schools again without efficient teachers for them, and they must get their training at a good university. The whole school system of this province is bound together; you cannot touch a single part of it without bringing ruin upon some other part And while it may appear that it is a grievance hard to be borne that some people should get the means of abandoning the old farms and going to the cities and towns, where to us who stay in the country it appears that everything is lovely, and they have easy times and more money than they know how to spend, while we have too little—while that appears on the surface it is not altogether prudent and right to take that view as the final one. There are many sons and daughters of farmers who can get the beginning or the foundation of a good, liberal education at the home school, but if there are no good high schools within easy reach, they are stopped short right there. In many instances their parents cannot afford to send them away from home and they cannot even go so far as to fit themselves to be good public school teachers. Why should we as farmers deprive our children of the chance to fit themselves to get a start in life that many a man has got by teaching the public school? It is not fair or right to represent the public schools as the only schools in which the farming community has a direct interest.

Mr. IRVINE: If this resolution is carried it will make higher education good only for the rich man's son, and the poor man's son will have no chance beyond the public school. We know that the poor man's son often has abilities far beyond that of the rich man's son, and let us not put a bar in the way of his getting his education to the very utmost. I myself cordially agree with the present system.

Mr. D. E. SMITH: I agree with the remarks of the two gentlemen who have just spoken, but I think there is one defect in our educational system, if some of the subjects taught at present could be changed to others that tended more to assist the farmer, it would be a great deal better. For example, there is a great amount of French and German being taught in every high school. There is no necessity for it as a mental training, and it is not accomplishing any good, because most of those who receive that instruction never use it. Now if instead of such subjects we had something that tended to lead one to see the beauties of farm life, our boys would take to the farm and become better and more useful men. Therefore, in place of reducing the grant, I think that we might better ask that there be a change in the curriculum of the high schools.

Mr. JAMES SMITH: With regard to higher education I would say that my reason for raising this objection to-day is that the whole tendency of our high schools seems to be to lead away those who enter them to be non-producers and do not offer them any inducements to return and be producers. Now as soon as there is an unnecessary number of non-producers they become parasites on the producers. Were it not for this tendency I would not offer this objection to our present system. I was only a poor boy—I am not very rich yet—but I fitted myself for a public school teacher, and I never had the advantage of a high school. I went to an academy and paid my way, and I am not a bit the worse of it to-day. It has not belittled my manhood at all; I have more manhood by having paid my way there, and I consider that all those who are worthy of an education have the same within their reach and that they work their way through let them be poor or rich to any position which they wish.

Mr. ANDREW KENNEDY: This matter of higher education for the farmers I think should be taken carefully into consideration by us. I hold that anything in any line that would be derogatory to the interest of the poor man in educating his children in this country is in the wrong direction. I think that we even as farmers have a right to be thankful for the present educational system. Contrast our position to-day with what it was twenty-five years ago. Although I have never given a vote to sustain the Mowat Government, yet I think they make a point every time in regard to the schools of this

country. I think we would be very foolish to throw any obstacle in the way of the educational facilities of this province. I know in my section of the country there are many poor men whose children if they had not had the opportunity of being educated in the high schools would not have stood in the position in society that they do to-day, and I think it is a credit to the province.

The PRESIDENT: In regard to what Mr. Aylesworth has said about not wishing it to be understood that the public school was the only school for the farmer, that is not what I said. I said that to a large majority of the rural pupils it was their only school, and I was simply pleading for a better school.

Mr. Smith's resolution was then put to a vote and lost.

Mr. JEFFS: In regard to the transportation of farm products, I am satisfied that if some assistance somewhat similar to that were given to these ocean greyhounds to carry our produce to British markets, it would give great satisfaction to the farming community of Ontario.

Mr. DANIEL WOOLLEY: I want to hear these big men. I want to hear how to farm better. I was delighted with that paper, but I am sorry for the time we lost on one point. I was thinking if we had a little better education—or, as I told one man, a little less—it would be better for us, because then some of the resolutions we fooled so much time over would never have been written. But while I did say that our muss this forenoon showed that farmers should not go to Parliament, yet I am glad to say that that paper shows that a farmer here and there may. I move the adoption of the paper.

Mr. SMITH: I second the motion.

Mr. MCDONALD: I move in amendment that we take the matters up one by one. There are several other matters referred to to be discussed, and we may as well take them all up together.

Mr. CLARKSON: I think it should be discussed each matter separately, and then if we wish to adopt it in its intirety we may do so.

The CHAIRMAN: We will take those other resolutions now that were to be discussed with this paper.

The President (Mr. McEwing) then returned to the chair.

The resolution of Mr. Hislop, "That, in the opinion of this meeting, a policy of free trade such as prevails in Great Britain would be beneficial to Canada," was then taken up.

Mr. STEWART: Are we to take that as it reads literally: that we throw open our markets to all the world as Great Britain does? I for one would be opposed to that. I am perfectly willing to throw them open to Great Britain, but not to the United States under existing circumstances.

Mr. JAMES ROBERTSON: I think the spirit of that resolution was that we throw open our ports to Great Britain—not further than that.

Mr. ARCHIBALD HISLOP: I did not propose making any speech on this question; I thought the motion would speak for itself; but seeing there is a misapprehension as to the meaning of it, it may not be amiss. You are all well aware that Great Britain is practically a free trade country, or, at least, their policy for the last 40 or 50 years is as near the ideal free trade as is possible to obtain consistent with raising revenue. My idea was this: For us to adopt a similar policy, that we abolish all duties on necessaries, and raise our revenue wholly and solely on luxuries, the same as they do in Great Britain. Of course, I don't say that in this country we should go to work and levy duties on the very same articles or in the very same way, but I think there is sufficient statesmanship in this country to devise a means of raising revenue to carry on the economical and just government of the country without imposing burdens upon farmers or upon the laboring classes. One gentleman has said he would object to opening our ports to the United States. Well, I would be in favor of trading with all

countries in the same way, because, supposing that the United States impose a heavy duty on any particular article that goes from this country into that, who are they injuring? They may be inflicting some injury upon this country, but a much greater injury upon themselves. And it is the same with respect to us. Suppose they put a heavy duty on agricultural implements going from here, and we retaliate with a duty of 40 or 50 per cent., we may do the manufacturers of the United States a slight injury, but we do ourselves a far greater injury, because we are compelling the people of this country to pay a much larger price than they would have to pay if those implements came in free. So that, no matter what the United States may do or any other country may do, if they have a mind to impose duties that will be a burden upon themselves and inflict a slight injury upon us, it is no reason why we should follow in their footsteps. If they see fit to strike us on one cheek, it is no reason why we should blister the other ourselves. I think that the policy suggested by the motion would be a much better policy for all classes in this country than the policy we have now. I would like to see you approach this question in a calm and judicial manner; do not discuss it as politicians but as business men, as farmers. You know the manufacturers can meet together and discuss the tariff question as business men, not as politicians. They can lay their heads together, Grit and Tory, and send deputations to Ottawa to help through legislation in their interests, and why cannot we as farmers do the same? I think we have had a pretty fair trial of the high tariff in this country now, and how many farmers here to-day will get up and say that they have been benefited by it? How many farmers here have got enhanced prices for their products through the instrumentality of this policy? I believe that for every one farmer who has got an enhanced price for his products there has been 100 injured. The manufacturers have had a pretty good time of it now; the sugar refiners can go to England and build mansions and live there after having filched so much money out of the farmers of this country. An agricultural implement maker of Toronto can give $100 000 to this institution and to the other, but did he earn this money honestly? He may have earned it legally, but it was the law of this country that permitted him to charge exorbitant prices for the goods that he sold. And it is the same all through. Now, I say that the farmers of this country are not asking any class legislation, but they ought to ask to be set on an equal footing with all other classes of the community. If we have to work from daylight till dark from one end of the year to the other and look to the markets abroad, where we have to compete with the whole world in the sale of our products, I want the manufacturer and all other classes to do the same. (Applause.) We all know that in Great Britain the necessaries of life are not taxed as they are here; they raise a great deal of their revenue from income and other sources; the bulk of the revenue is raised by duty on spirits, liquors and tobaccos. Now, I don't care how high you tax liquors and tobaccos, but I dislike very much to see a heavy duty placed on the cotton shirt that I have to wear and the tweed coat that I have to put on to keep out the cold. And another thing, since this matter has come up, I think that the tariff of this country discriminates against the poor man in favor of the rich. To a man that can afford to wear a fine broadcloth coat the duty on it is probably about 25 per cent., but the poor fellow who has to wear coarse tweed like me finds it taxed about 60 per cent. I want to get the thing simplified so that the burden of taxation will be placed upon the shoulders most able to bear it, and I think the people who persist in using luxuries are the ablest ones to contribute to the revenue.

Mr. PRINGLE: I think we who are getting grey will have to look to our laurels. I endorse every word that young man has said. Now, as to the question of raising revenue by other means than the present. As it is now, in raising this revenue there is taken out of my pocket, and out of the pockets, I claim, of every other farmer, at the rate of about $1 an acre. If I have 100 acres I am taxed about $100 dollars. Now, if there is a deficiency in raising revenue after the excise duties and the taxes on luxuries are paid, I would rather submit to direct taxation; I would rather pay $10 by direct taxation than pay $50 or $60 by indirect taxation as I do now. I certainly pay twice as much taxes now indirectly as I ever would be called upon to pay by direct taxation.

Mr. Beam: About our trip to Ottawa last year, I differ a little from our President. We were cordially received and kindly treated there, but not by the chief members of the Government. We were treated the same as other delegations. I understand it is the custom to receive these deputations in secret; but if any parties going there—railroad men, contractors and manufacturers, farmers or anybody else—should not the country know what they are asking for, and the press have a right to criticise the matter? The speeches and everything that was said were suppressed, and I for one was greatly disappointed. What we do here is open and above board; we are not ashamed of what we do or what we ask for. Now, this question of free trade with England is a grand one. Why should we not cultivate that trade? England takes much from us and we can receive much in return. This is something we can do; reciprocity with the United States is something we cannot do alone.

The Secretary: I think the matter of that deputation has not been put exactly in its proper light. As soon as I went home last year I wrote to the member for our county and asked if he could arrange for a meeting, and sent the communication which you directed me to send to him. He wrote back at once and said as probably no changes would be made at this session, as, I supposed, it was so nearly completed that if we wished to postpone it until another time all right, but if not he would make the necessary arrangements. I consulted with our President and we telegraphed to each member of the executive asking them this question, "Are you favorable or not to proceed at once?" The moment I got one reply, Mr. Beam's I think, that he thought we should proceed at once, I wrote every member of the committee that we would leave at the earliest date for Ottawa, and we did so.

The Chairman: I think this discussion is out of order.

Mr. Sheppard: I am quite in sympathy with the wording of the resolution, but I think this subject was discussed at a meeting here last year on pretty near the same lines, and the result of that was this delegation to Ottawa of which we have heard over and over again. Now, in going over this same ground again we are discussing an abstract question which we cannot settle, which we will never be able to settle, and we are wandering away from what I consider the interests of the Institute. I would like to see changes in the tariff looking in the direction of this resolution, but it seems from the result of the action last year that we gained nothing, and I cannot see why the time of the Institute should be taken up discussing it.

The President: This resolution is not on the lines of the resolution adopted last year. The resolution last year was looking towards the opening of our ports to British goods free of duty. This is free trade pure and simple with the world.

Mr. Hutton: I live not very far from the American line. Formerly I used to raise horses for the market, and I have paid $300 a year into the American exchequer as duty on horses. Some say I don't pay it, but I say I do. And in opening our ports to the American people in this way we take the initiatory steps in getting into their markets. I am interested in that as a farmer, not as a politician, and I come here to advance the interests of the farmer and my own interests in that direction, and I don't care what government I embarrass if I don't get my rights. I have rights as a farmer, and I say let us as farmers let our governments feel that we want our rights and want them now. (Applause.)

Mr. Walker: I regret very much that this question of free trade should be introduced at a meeting of the Central Farmers' Institute. That, as you are aware, is the matter that divides the two parties of the present day, and I think it is unfortunate that it should be introduced here. Now, in West Middlesex where I come from, I try to help and build up our local Institute, and in soliciting my neighbors to join, a great many of whom are Conservatives, they say, "No, it is just a Grit concern, it is run in the interests of the Grit party of this country." I try to talk down that feeling, and I had succeeded to a considerable extent in doing so, but I regret very much that I will not be able to report to my people when I go back that my views were correct. I think this matter is a direct drive at the Dominion Government, and I think it should not be introduced here

at all because we don't all think alike on this question. I think it will weaken the Institute, and besides, I don't believe in debating this free trade question at all.

The PRESIDENT: The object of this meeting is to discuss matters of interest to the agricultural community as farmers, not as politicians. Now, I want to know why this body of men so directly and so heavily interested in the matter of the tariff should be shut out from the discussion? And further, we have representative meetings of manfacturers in this country and it is just as much a party question in their case as with us. Do they discuss it? Of course they do at every meeting, and they take such action as they think is in the interests of the manufacturer, and why should we not discuss the situation and take such action as we believe is in the interest of the farmer? But by all means keep your party politics behind you and talk it from the farmers' standpoint.

Mr. LINDSAY: In regard to this being a party question, I may say that I am a Conservative and voted for the N.P., but I do not consider this matter belongs to any party. They may adopt it, but we have a perfect right as the representatives of the several Farmers' Institutes of this Province to discuss any matter whether it is a plank in the platform of the Tories or Grits or any other section. We are here in the interest of the farmer and we have a right to discuss those questions that affect him, and we believe that question does affect him. These questions have been left too much to party politicians, and I can assure you that it is not only among those of the Reform persuasion that there is dissatisfaction; there are any number of old time Conservatives who are just as much dissatisfied with the way matters are conducted at the present time as any Reformer in the house. Take our corn question for one—a man that wants to run his brewery can bring in all the corn he has a mind to, but if a farmer is short of corn to feed his hogs can he get corn to feed them here on the same terms? We know how that is.

Mr. WOOLLEY: I am in sympathy with all of you; I am a farmer, and I am astonished that we worship party as we do and forget our country and our interests. My friend over here reminds me of a little occurrence when I was a boy; two boys got into a fight, and one of them when the other fellow got into his hair, which was a tender place with him, says, "Oh, let's have no pulling hair in this fight." I am astonished that we can discuss every other question in the interest of the farmer but "don't touch the tariff." Politics don't mean party if I can understand the definition.

Mr. JAMES SMITH: I think we would be belittling ourselves as a body of farmers to say that because we met with some discouragement through our deputation to Ottawa last year that we should simply drop the question. If we are in justice entitled to the demands which have been made, and if the deputation was not met by the Minister of Agriculture or the Minister of Finance, then, I say, let us send another deputation. Let the government at Ottawa know that we are in earnest and we will not meet with a rebuff. With regard to the question of free trade, I am in favor of the motion.

Mr. CUMMING: I think this question strikes at the very bottom of the success of the farmer. Every farmer to my mind is a manufacturer, only instead of using inanimate objects like silk, cotton, iron, etc., he uses the whole realm of nature almost in manufacturing his goods. Now, what do the manufacturers plead for? To get their raw material at the lowest possible cost. For instance, for fine tweed goods made out of Buenos Ayres wool the wool comes in free, but the coarse wool that goes into carpets and is exported largely, there happens to be a duty on that. That is wool that we don't import a pound of, but the wool that is imported, the fine wool from South America and Australia, comes in free. It is done just to pull the wool over the eyes of the farmers. Our manufacturers to day are always going to Ottawa and getting their raw material cheaper and from time to time getting their manufactured goods higher protected, and who pays for it? You farmers. You want to stand right up in your might and say, we want our raw materials at the lowest possible cost. Now, what are our raw materials? The goods that you have to consume, your clothes, etc. You know the government cannot raise the price of cheese, butter, or fat stock. You have to compete with the world in almost everything you have to sell; you have to meet the farmers of Russia or South America or any of the United States in the market, and if you have to sell your goods handicapped by the high cost of raw materials you cannot compete with them and make any money. Take an instance: I

get a paper from my native town in Scotland, and I find there corn starch made in Canada is sold at four pence a package. I go across the street and I buy a package of corn starch and I have to pay ten cents for the same package; eight cents in Scotland, ten cents in Canada, made out of corn brought from the United States and made down at Edwardsburg. And that factory has got to be so great it actually arrogates to itself to say who shall be the member of Parliament for that county. Now, there is nothing in the world will make better butter in winter than corn-meal, but if you bring it in I happen to know you have to pay $8 a ton duty. Then you have to send your butter to England and compete with the butter made in Illinois. Or if you feed your cattle you have to send them to England and compete with the cattle of Illinois that are fed on free corn. Is that the right way to treat the farmers? You failed at Ottawa, but when you go to the ballot box, see that you don't fail there.

Moved in amendment by J. C. Hanley, seconded by R. A. Jamieson, "That the delegation representing the Central Farmers' Institute at Ottawa impress as strongly as possible on the Dominion Government that the Institute favors the application of the principle of free trade with all countries as far as possible consistent with the necessities of revenue and the general interests of the country."

Moved by Mr. Hunter, seconded by Mark Walker, "That this Institute take no action in the matter of the free trade resolution now before the chair believing it will be detrimental to the good of the Institute."

The President: I will have to rule this out of order because the motion is now before the meeting and under discussion, though the amendment is quite in order.

Mr. Hanley: I may say that I am in favor of the principle of the first resolution; I believe that we cannot call ourselves free men unless we have the right to trade with every country, to buy where we can buy to the best advantage and sell in the same way, but I think the resolution as worded will not express the views of a good many of us. In the first place, I feel that Canada and England are not in the same position, one being an old and rich country, the other being new and comparatively poor. Then it is possible that at certain times we may find that a little protection is necessary in certain lines irrespective of the necessity of raising the revenue. I don't think we have any wish to injure the manufacturers, but we think that while they have been protected so long, while they have been treated as infants for 14 or 15 years, it is time that we should be treated as infants now and our industry built up. But suppose that such an industry as Armour & Co. of Chicago were to flood our markets with their products from the west and drive our own butchers out, we might think it necessary for the protection of our local men against that great monopoly to put some duty on to keep them out. Our aim is to destroy monopolies, but we must take care that we don't build up monopolies in the States. I think, therefore, that I could not support the resolution as it is put, and I put it in a shape that I could vote for it myself.

Moved by Mr. Lick, seconded by Mr. Muir, "That this question be laid over until next year."

Moved by F. W. Fisher, seconded by H. Woolley, "That discussion on this subject be closed and a vote be now taken."

Mr. McDougald: I think there has been enough time taken up with this subject, but it gets down just to this, if we have free trade on the lines that they have in England we must raise the revenue here by direct taxation; there is no other way. The succession tax raises a large revenue in the old country, but in this country we raise very little. Now, I believe myself that Mr. Pringle struck the key note on that subject. It would be better for the farmers if all form of indirect taxation was abolished and we got down and paid directly what we pay indirectly. Raising revenue by tariff is like raising money by toll gates. $500 was paid by the people for every $100 that the Government got. I have discussed this matter with my brother farmers at other times and I think the sooner we get down to that system, enabling us to buy where we can buy cheapest and sell where we can get the best market, the better for us. We would kill monopoly and pay our taxes with far less money than we are doing

to-day. There is another thing we complain of, the cost of government, the enormous number of officials and the extravagant salaries frequently paid. Do you suppose, Mr. President, that we could endure that for one year if we knew what it was costing us individually. Indirect taxation was invented in the first place to assist monopolies, and it has been perpetuated in order that we might not know just what the cost of the government was to us individually. In paying money into the municipal treasury, when the collector comes around in the fall if there has been an increase in the taxes I guarantee every one of you wants to know the reason why. So it would be with the federal taxation added to the municipal; if there was an increase in that we would want to know the reason why, and I tell you we would put on the brakes on the extravagance of our Government that we can't do in any other way.

Mr. CHAMBERS: I think it is injudicious to go on with a resolution of this kind because it places us in a very peculiar position before the country. If you look over the resolutions before this Institute you will see the point. The Farmers' Institute met originally and passed a resolution in favor of Commercial Union, the next year it was in favor of Unrestricted Reciprocity; then they passed a resolution in favor of free trade. They also passed a resolution in favor of free trade with the United States and England; last year we passed a resolution for free trade with England. Never on two consecutive years have we passed the same resolution, and to-day we have a resolution for free trade such as they have in England. Is there any guarantee that the Institute will not meet here next year and pass a resolution in favor of protection? Such a thing might occur. You send deputations to Ottawa, but you have not sent a deputation for the same thing twice. I object to the discussion because this is an institution supported by public money. Reference has been made to the Manufacturers' Association, but they are a private body meeting to consider their own interests. They are not paid by public money, but we are met here and we are paid largely from the public treasury, the treasury which is supported by both political parties. These resolutions place this Institute very much in the position of the Irishman when he came to the United States, he was asked "Are you a Democrat or a Republican?" "Why," says he, "have you a Government?" "We have," they said; "Well," says he, "I'm agin them." Now I object to this resolution because I think others would object to it if they understood what the free trade they have in England is. Suppose you have a conveyance with four wheels and which is drawn by two horses, you pay a license in England for that of two pounds two shillings; you have to use stamps when you have cheques or drafts cashed. You find these articles on the free list here are taxed in England; and yet this is English free trade. Another point is that if you want to get married in England by special license you have to pay five pounds, whereas in this country we have adopted a policy to protect infant industries. (Laughter.) Now this country has passed through a depression which has affected all the countries of the earth, and I am satisfied that we have come through it in a condition which is most satisfactory; and I maintain that that position is largely due to the policy which maintains in this country.

Mr. WHITE: I am a farmer; I have no other means of making a living, but I certainly am opposed to direct taxation. We have got direct taxation in municipal matters, but I would like to know if the men who have the money in the municipalities pay for the improvements in the township. It is impossible to get at the men who have the money. They evade the assessor and it is impossible to make them pay their full share; and until such time as our municipalities can get at the men who have the money in our municipalities to pay the township taxes I think it is useless to talk about raising the revenue of the country by direct taxation. About corn, if we got our corn in free wouldn't the farmer over in the States get the benefit of it, the producer? If we would get more for our barley if it went into the States free wouldn't the American farmer get more for his corn coming in here free?

Mr. PRINGLE: The market is fixed there.

Mr. WHITE: Another thing is why we should have direct taxation and allow so many to go without paying taxes at all? Supposing you have a servant girl at $7 or

$8 a month and a hired man at $200 a year, hasn't that man got a right to pay his share towards the affairs of the country? I believe these servants have the same right as we have to pay their share.

Mr. Hislop: There appears to be a misapprehension as to what I meant by this motion. The wording of it may be defective, but I did not advocate a policy that would necessitate the Government of this country resorting to direct taxation, I said my object was to have the customs taxes of this country raised consistent with the revenue, or in other words, no more taxes levied upon the people than was absolutely necessary for the Government of the country economically administered, and I am willing to amend the resolution to that effect. A protective tariff is not calculated to raise revenue, its object is to shut manufactured goods out, to prevent them coming in altogether, and if you prevent them coming in how are you going to have a revenue? When this country was much poorer than it is now it raised sufficient revenue on a 15 per cent. tariff, and why not to-day? My object is to have the tariff left in such a way that it will come upon the luxuries and not upon the necessaries of life.

The amendment to the amendment, "That this question be laid over until next year," was then voted on and lost.

Moved by P. Stewart, seconded by W. M. Paul, "That this Institute is of the opinion that it would be unwise to have free trade with any country not willing to accord us the same privilege."

Mr. Kells: I think it is a question that requires consideration before we can vote intelligently on it. Has one man who took the floor showed you that we are going to pay less taxes in the Province of Ontario if the revenue is raised the same as in Great Britain? Not the first man has said so. We are having duties on whiskey and tobacco now. The very policy of the present Government is to tax the luxuries of life in this country. As an old member of this Institute,—I was here from the first, I have tried to build it up, tried to show the Conservative friends of mine that it was not a Grit association, tried to make it what it ought to be. I have done that and fought for it every year since its origin, and I hope you will permit me at this my last meeting—for the Conservatives here are going to leave you, gentlemen,—(cries of no, no), to tell you my reason. These free trade resolutions were choked down the necks of people when there was no time to look at them and consider them intelligently. Let a man show me that the plan of raising revenue in Great Britain will bear lighter upon us than the one we have now, let him show it and I will sit down. I am not going to try to put a burthen upon the people of this country and pile upon them the taxes that the people in the old country are groaning under to-day. They are a poor people while we are wealthy; we are a free people with plenty of money at interest. The Government of this Dominion and the Government of this Province are doing their best to meet your wishes. You are running with resolution after resolution here and burdening and embarrassing the Government of this Province by doing so, and how many of them have been carried into effect? How many have they been able to carry into effect? Precious few because they are legislating for this whole province not for you farmers, and a few farmers institutes. And the Dominion Government represents the whole Dominion and has a right to give everybody fair play. I think it is out of place to press any such resolution, and I take it just as a slap from the Reform party here assembled at the Dominion Government. (Applause.)

The President: I am surprised at Mr. Kells taking the extreme ground he has in regard to the resolutions we have passed along that line, for Mr. Kells was the very mover of that resolution last year. Although it did not go quite as far, it was right in the same line, and it is rather astonishing to hear him talk as he has done now.

Mr. Stewart's amendment to the amendment, "That this Institute is of the opinion that it would be unwise to have free trade with any country not willing to accord us the same privilege," was then voted on and lost.

The amendment moved by Mr. Hanley, seconded by Mr. Jamieson, "That the delegation representing the Central Farmers' Institute at Ottawa impress as strongly as possible on the Dominion Government that this Institute favors the application of the

principle of free trade with all countries as far as possible consistent with the necessities of revenue and the general interests of the country," was then put to a vote and carried.

The motion of Mr. FRASER, seconded by Mr. GOOD, asking that superannuations and pensions to militia officers be abolished was then taken up.

A MEMBER: I understand from the late Minister of Agriculture that there are no superannuations in this province, and it would look very ridiculous to pass a motion of that kind.

The PRESIDENT: I believe you are quite right; there are no superannuations in this province.

Mr. DANCE: I know for a fact it does exist in one or two cases, and it is authorized by Act of Parliament. Some few years ago when I was a member of the Legislature the City of Toronto obtained power to grant an annuity of $2,000 a year to their treasurer who had occupied the office for a long time and was then retiring, and I thought it my duty as a citizen of this country looking towards the economical administration of affairs to endeavor to stamp out the principle, which I believe is wrong. When a man receives a salary high enough to enable him to lay by something for old age, it should not be necessary to come and say, "We want special legislation in order that for the rest of his life he may receive a good salary for doing nothing." There were thirteen members of the Legislature voted against the proposition at the time.

Hon. JOHN DRYDEN: I think it is important that we should understand the question that we are voting upon. It is true that there was a case as cited by Mr. Dance in which the City of Toronto procured power to do something along these lines, but it is well for us to know that there is no law in the Province of Ontario under which superannuation can be granted. The most that has been done is to grant a gratuity in a case where necessity has been shown in regard to widows. These, of course, appear in the public accounts from year to year, and amount to small sums. They are voted from year to year by the Legislature, if at all. And so it is well for members to understand the distinction between what is done in Ontario and what is done under the law of the Dominion. If it is intended simply to strike at the Superannuation Act, then I think it would be desirable to make that plain, so that we would not be apparently voting against something that does not exist in the Province of Ontario.

Mr. FRASER: I will withdraw the resolution.

Moved by Mr. WOOLLEY and seconded, "That the statements made by the President in his address be endorsed and the thanks of the meeting be tendered to him for the able manner in which he has discussed this question." Carried.

WHAT IMPROVEMENTS CAN BE MADE IN GENERAL FARM PRACTICE THAT WILL MOST PROMOTE THE PRESENT AND FUTURE PROSPERITY OF THE ONTARIO FARMER.

Mr. FRASER then read the following paper:

Without doubt this is one of the most important subjects that will engage the attention of this Institute. With the existing depression in all agricultural lines, farmers are looking eagerly for any suggestion that will promote their prosperity, either present or future. I regret so important a paper has been intrusted to me, for I feel my lack of ability to do the subject justice. However, as an old military man, I know obedience is my first duty, so I hopefully fall into line and take up that formation which will be most effective in attacking the vulnerable points of all opposition to our farmers' prosperity.

To be a successful farmer, three things must be observed, namely, economy, industry and contentment. Two of these, the former and latter, are not to any perceptible extent adopted by the average farmer to-day. The lack of economy brings in every instance a train of evils. To succeed it is not necessary for a farmer to be great in finance if he is

only great in economy, more especially in small things. Now, one of the greatest evils in existence, and that annually destroys the prosperity of thousands of the farmers of this Province, is the credit system, which has been and is brought about from the lack of economy. Destroy the credit system, and you will do more to promote the prosperity of the farmers in five years that can be done in a decade by teaching them scientific methods of crop production and stock feeding. It is a system that tempts men from legitimate paths and makes them lifelong dradges, even if it spares them from ultimate ruin. You may pick out any man who adopts this system, and in nine cases out of ten you will find him a hewer of wood and a hauler of water for the term of his natural existence. It is useless, so far as the individual it concerned, to teach him how to increase the fertility and productiveness of his farm, for though it increases the prosperity of his country and community, it does not increase his prosperty. It increases his credit and as a consequence it proportionately increases his expenditure, and an increased number of bills to meet at the end of the year. When will men learn the simple truism that it is not the amount of money they earn that makes them prosperous, but what they save! The great fundamental principle to be taught to make general farm practice more profitable is to teach men that success in life cannot be attained till they learn to make their income greater than their expenditure. It is poor economy indeed for farmers to run accounts when they have money in their pockets necessary to pay all current expenses, and spend that money foolishly for articles that are not necessary for their convenience, comfort, or well being; yet this is exactly the lines followed by the great majority of our brethren. In the end there can only be one result—lack of prosperity. The difference between the ordinary class of business men and the agricultural classes on this point is that whilst the former makes calculations to meet his bills when they become due, the latter does not. Ask the manager of any loan company or any money broker how many farmers who borrow from them make calculations to meet their obligations, and they will tell you not one in twenty. Instead of that their next application is for an increased loan; their money, the proceeds of their farm products having gone to pay current accounts. I cannot press too strongly the point of paying as you go along, even though you have to pay a little more, it will pay you to pursue that course. It may be convenient to run bills at times, but you always pay dearly for the convenience.

Economy in finance is not the only point to observe in that line, but in many others as well, more particularly in the care of agricultural implements. Roughly speaking there are 200,000 farmers in this Province, all using expensive agricultural implements, and, at a very low estimate, an average loss of $20 per year is incurred through neglect in use and housing to each farmer, or a total loss to the Province of $4,000,000. Our total export of agricultural and animal products for 1892, was $50,000,000. Suppose Ontario contributed half that amount, which is a fair estimate, our loss from the source above referred to was nearly one-sixth of our entire export revenue. Let me give you another illustration. Twenty-five years ago our export trade in animal and agricultural products amounted to $19,000,000; in 1892, it was $50,000,000, or an increase of $31,000,000. This splendid showing has largely been brought about by improved systems of agriculture. We have increased in numbers it is true, and also in the acreage of our cleared lands, but we must remember that prices have largely fallen, and there are other factors which affect these to a large extent. I think these figures safely bear out the assertion that our farmers receive $2 where twenty-five years ago they only got one. Why, then, are they not prosperous? Many are, but with the majority, as I previously stated, there is a lack of economy and general carelessness in caring for farm machinery, etc. The greatest combine the farmer has to contend with is his own carelessness and shiftlessness, and if he devoted a portion of the time he now spends attending meetings, discussing combines and trade legislation in caring for his machinery he might safely defy the strongest combine and the highest protected agricultural machine manufacturer.

As regards industry, I believe there is no class of people who work harder physically than our farmers, but time is bringing changes of condition that require the closest study and good judgment, and it is not wise nor profitable to indulge in too much hard manual labor to the neglect of mental vigor. The latter is the great factor now a-

days, and to make a success the farmer must give his undivided attention to and conduct his business in an economical and businesslike manner. He must exercise the closest supervision in everything, more especially in the details. Remember if you look after the pence the pounds will look after themselves. Have everything in readiness, that there may be no delay when the proper time comes when any work is to be done. Adopt a system in everything, and have all things arranged in your mind before hand when and how you intend to do them, and carry that system out. Less physical and more mental labor is what is now required. Adopt a system of keeping accounts and drop all unprofitable lines; facts and not guess-work must be and are the only safe foundations for any business to build on.

Let us now dwell briefly on the great necessity of contentment. Always conduct your business so that, no matter what the results are, you have the satisfaction of knowing that you did your best, and be contented with those results. At the same time plan to improve in the future over the past; remember that hope is the steady friend of man and that upon yourself alone you must rely. Pay little heed to the statements of depression, hard times, high taxes and "down trodden" cries that pervade the country, but remember that the times, good or bad, depend largely on your own efforts. There will be years when you will not succeed as you could have wished, when you will be inconvenienced somewhat, but such has been the state of affairs in the past and must continue in the future; and always be prepared for them. Remember it was an empty stomach, brought on by shiftlessness, that made Esau sell his birthright.

Do not forget that this country offers you advantages unattainable elsewhere, and as farmers we enjoy privileges equal if not superior to those of any other class in our Dominion; and I have no sympathy with those movements or individuals who are trying to breed discontent in our midst simply because they are reaping the fruits of their own negligence and wish to place the responsibility on other shoulders.

Farmers as a rule in this province are not only holding their own, but they are actually outstripping every other profession, and the many happy homes and comfortable firesides that surround us in all directions, contrasted with the misery, want, suffering, and general depression in mercantile lines is sufficient proof of this statement. If those who are not successful would use a little more economy, take better care of implements and stock, and devote themselves solely to the business of their farms, planning and providing carefully for the future, and above all drop once and for all time the credit system, they would be themselves surprised at the results. What our farmers want is not so much teaching how to produce good crops—for we surpass every country and this continent in that respect—but more judicious care in the expenditure of the proceeds of those crops.

A vote of thanks was tendered Mr. Fraser for his paper.

Moved by S. B. Gorwill, seconded by D. E. Smith, "That the time for discussing any paper before this Institute be limited to one-half hour." Carried.

Bee-keeping. Moved by J. B. Muir, seconded by T. G. Raynor, "Whereas, Canada and especially Ontario, in its recent triumphs at the World's Fair, Chicago, and in the past elsewhere, has shown itself able to compete with any country in the world in the production of first-class honey, therefore it is resolved that the Dominion and Provincial Governments be requested to do all in their power to develop the bee-keeping industry in Canada." Carried.

Trade Returns. Moved by A. P. McDougald, seconded by Peter Stewart, "That the executive committee memorialize the Dominion Government to furnish each member of this Institute yearly with a copy of the Dominion Trade and Navigation Returns."

A Member: We simply belong to the Province of Ontario, and these trade returns belong to the whole Dominion. Are we justified in asking them to furnish us with what is furnished by the whole Dominion?

Mr. Fraser: These returns can be secured by any individual here. Though I think it would be wise to study these returns, yet if they were scattered broadcast over the country many of you would not look at them.

A Member: Any person sending a postal card can receive them for himself, and if he thinks they are not worth that he would be better without them.

Mr. McDougald: We have been discussing the trade question to-day, and we have been discussing it to a great extent in the dark. I know of applications being made for them and the applicants not receiving them, but if they can be had for the asking what harm is there in the resolution? While the government are printing thousands of them what does it amount to that they print 150 copies more?

Mr. Awrey: I think we ought to think about the character of the resolutions we pass. If it mean that a copy be sent to each member of this Central Institute it would not amount to so very much, but you must remember that there are about 12,000 members of Farmers' Institutes throughout the province, and it is an unreasonable proposition to ask the Dominion Government to send out that number. It would be an enormous expenditure, because it is a very large volume, and it would be some tons of matter. In all probability it would double the cost of printing that that department has already gone to, and we are complaining day by day and year by year of the largely increased expenditure in the different departments of the several governments. Although politically opposed to the Dominion Government, yet I say that any public document that any person is interested in and wants to get information from, has always upon all occasions been cheerfully forwarded. I think it would be practically throwing away some hundreds of thousands of dollars to supply them in the numbers proposed, and we simply detract from our influence when we ask for something that is unreasonable.

The President: It simply calls for one for each member of this Institute.

Mr. Hislop: I object to the principle involved, asking the Government to confer a privilege upon us that is not open to every other citizen of this Dominion. I think if the members are hungering and thirsting for the knowledge contained in those returns they ought to put their hands in their own pockets and pay for them.

Mr. McDougald: We only ask for a copy for each member of this Institute. We are not asking for favors, we are asking for rights; we are asking for information and the means of obtaining it. The resolution was then put and lost.

Moved by P. Stewart, seconded by A. P. McDougald, "That in the opinion of this Institute, the Legislative school grant to Public Schools in Ontario should be increased, and that the executive of this Institute take immediate steps to secure this end." Referred to the Committee on Legislation.

Moved by James Cumming, seconded by James Bissell, "That the Dominion Government be urged to legislate in the direction of reducing the maximum rate of railway passenger fares and freight charges so that the people of Ontario may not be required to pay more for the same services than the residents of a foreign country." Referred to the Committee on Legislation.

Moved by Duncan Stewart, seconded by Donald Jack, "That in the opinion of this Central Farmers' Institute much of the money spent for immigration in the past has been worse than wasted, and that further expenditure in that way would be unwise and contrary to the best interest of the majority of the people of this country." Lost.

Moved by Andrew Currie, seconded by George Island, "That whereas at the present time many of us, the farmers and producers of this province, are at considerable disadvantage through lack of knowledge regarding the scale of fees for public weigh scales as provided by the Provincial Government, be it resolved by this Central Institute here assembled, that we petition the proper authorities to have printed and posted and maintained within easy reach of the weigh scales the limit of fees that may be charged by the lessee or weigh master of public scales." Referred to the Committee on New Business.

On motion, the meeting then adjourned.

SECOND DAY—EVENING SESSION.

Business was resumed at 7.30 p.m., the President in the Chair.

The following communication from Mr. J. D. Edgar, Q.C., was read by the Secretary:

TORONTO, Feb., 7th, 1894.

SIR,—I take advantage of the important and representative gathering of farmers in Toronto to draw their attention to a very important piece of legislation that is pressed upon the Dominion Government and Parliament by the Boards of Trade; I refer to the proposed Insolvent Act.

As a representative at Ottawa of an agricultural constituency, I am anxious to learn the general opinion of farmers as to whether such a law is wanted by them, or whether it should be passed with its application limited, as is proposed, to traders alone.

It is to be observed that no machinery is suggested in the Bill by which any farmer can obtain a discharge from his liabilities, however honest and unfortunate he may have been. I enclose with this a clipping from the *Montreal Herald*, which gives an outline of the proposed Bill.

I feel certain that the great majority of members of the House of Commons who represent rural constituencies would, like myself, be exceedingly pleased to receive the benefit of the views of the Central Farmers' Institute or of its Legislative Committee.

I have the honor to be, yours, etc.,

J. D. EDGAR,

M.P. for West Ontario.

The Chairman Central Farmers' Institute, Toronto.

Referred to the Legislative Committee.

REPORT OF LEGISLATIVE COMMITTEE.

The second report of the Legislative Committee was then read by the chairman of the committee, Mr. Raynor.

9. With regard to the motion of Mr. Clinton *re* the French Treaty, we recommend that this be adopted.

10. Regarding the resolution of Mr. Gorwill respecting the width of roads, we recommend that this be deferred till the discussion on the paper to be read on the subject.

11. The resolution of Mr. McLean *re* the introduction of the Torrens System of Land Transfer. This is now within the control of each county council, and therefore no further legislation is needed at present.

12. This is a resolution from the East Lambton Institute as follows: "Resolved that this County Institute memorialize the Central Institute to put on record, and also to memorialize the Dominion Government, that, whereas the American Government are lowering their tariff in a manner very beneficial to this country; whereas the Canadian tariff has given rise to the combine system by which advantage has been taken to raise the price of that which we buy far above the law of supply and demand; therefore we consider that it is in the interests of the people that the Federal Government reciprocate every reduction made by the United States as we believe such reduction will, to a very large extent, relieve the Canadian agriculturist of the unequal burden under which he is now laboring." We recommend that it be deferred. It was not handed in before the discussion took place on the President's paper, therefore it was not brought up.

13. With regard to the resolution of Mr. Cumming as to reduction of railway rates, our report is that it be recommended.

Moved by Mr. RAYNOR, seconded by Mr. STEWART, that the report be adopted.

Mr. FISHER: I cannot allow this motion to come to a vote without making a protest. We have spent the whole afternoon listening to harangues on free trade, and because in one instance, I refer to this French treaty, it is going to conflict with our own interests, are we to transfer our principles and thereby erect a monument to our own

cupidity and inconsistency? I say no. I come from a first-class grape district where the industry is flourishing, and I say that the farmers of Ontario and those who have been enunciating free trade principles should not trade off their principles for a mess of pottage.

Moved by Mr. FLEMING, seconded by Mr. CLARKSON, that it be laid over until to-morrow morning. Carried.

THE FUTURE OF FARMERS' INSTITUTES IN ONTARIO.

President MILLS, of the Ontario Agricultural College, then read the following paper:

I was not long in the position which I now occupy till I saw very clearly that the Ontario Agricultural College was not reaching the farmers of Ontario. Most of the professors were unknown throughout the Province. They had no means of becoming acquainted with the farmers unless through the press, an agency which the best men do not care to use merely for the purpose of advertising themselves. Some farmers were looking at the College through political spectacles, and could see nothing good in it; others, while politically favorable to the institution, were afraid that there was too much truth in what their opponents said about it. The great majority had little or no faith in our work. Some openly said that the institution was a fraud; and not a few others honestly believed that it was, but did not like to say so.

Taking in the situation, I made up my mind that something should be done to bring the institution into touch with the farmers of the Province. It was founded for their benefit; and I was satisfied that it could not succeed without their sympathy and support. What was to be done? The farmers would not come to the College, so we decided to take the College to the farmers; but there were obstacles in the way. The professors were ready to go out through the country to speak at farmers' meetings; and the farmers were willing to hear them, but the difficulty was to find a time suitable for both. Some of the professors were free in the summer months, but farmers could not attend meetings at that season of the year; and the farmers had a slack time in January and February, but the professors were then engaged with their College work. So, after considerable thought and deliberation on the part of the Hon. A. M. Ross and myself, it was decided, in the fall of 1884, to abolish our Easter vacation, add two weeks to the Christmas vacation (making it a month), organize Farmers' Institutes, and send our professors throughout the Province to address meetings during the last three weeks of the Christmas vacation, that is, from the 2nd to the 22nd of January.

On receiving from the Commissioner a promise that an Act would be passed, and a small sum of money voted for travelling expenses, I proceeded with the work of organization on a limited scale in November, 1884. The first regular Institute meetings were held in the winter of 1885. In January of that year, we (the professors of the college) assisted in holding twelve meetings. Every year from that date to the present time, we have devoted the last three weeks of the month of January to Institute work. The number of Institutes increased rapidly—so rapidly that I had to arrange for no less than ninety meetings in January, 1891, and one hundred and fifty-eight meetings in the present winter of 1894.

We have now reached the maximum. We have covered the whole Province except Haliburton and two ridings in Hastings and one in Parham; and we feel like pausing for a little to look back over the past and consider what next.

By the present arrangement, the professors are enabled to leave the College at the time most suitable for farmers' meetings, and without interfering with their college work, and, so far, the beneficial results have far exceeded our most sanguine expectations. The professors have been benefited by listening to the comments of experienced men who have learnt much from the hard realities of everyday life, while the farmers have been helped by the enunciation and discussion of the scientific principles which underlie the best farm practice, and by the opportunity which the Institutes have afforded them for comparing notes with their neighbors and with prominent farmers from other parts of

the Province. At the same time, the College has been strengthened by the increased and ever increasing confidence of the farming community; and the country at large has been stirred up to a deeper, broader and more intelligent interest in the great subject of agriculture. Our Ontario farmers, young and old, are observing more closely, reading more widely, and thinking more deeply than at any time in the past. They are eagerly searching for information in all directions. In this respect the outlook is hopeful; and I have no doubt that a large share of the credit is due to the Farmers' Institutes. The Institutes have already accomplished a great work; and it is proper that we should consider carefully what can be done to extend their usefulness.

I would not have you infer that all, or even the chief part of the Institute work has been done by college men. The first deputations sent out consisted entirely of professors, but the work increased so rapidly that I soon had to employ outside help—general farmers, fruit growers, cattlemen, dairymen, sheep-men, swine-men, horsemen, apiarists, and poultry-men—a few of the best men in the country, to assist the professors and others sent out from the College; and some of these men have been found equal to the best of our professors.

So much for the past. What about the future? What shall it be? The answer will depend chiefly on five things:

1. The kind of officers which the Institutes appoint from year to year.
2. The extent to which local talent is brought out and developed.
3. The ability and efficiency of the men sent to assist at the winter meetings.
4. The amount of money which is voted for Institute work.
5. The character of the directorship.

Officers. By far the most important officer in an institution is the secretary. The majority of the secretaries now in office are good men, who know their duty and discharge it faithfully. But I am sorry to say that there are a few, of whom I must speak in different terms, well-meaning men, good fellows it may be, but so slow, indifferent and thoroughly inefficient as to be utterly useless. By nature, they are unfit for the positions which they hold; and, for the good of the institutes, their services should be dispensed with *at once.* An Institute with a live, active, pushing secretary, nearly always has a large membership and good meetings; an Institute with a slow, careless, inefficient secretary almost invariably has a small membership and poor meetings. *So Secretary, so Institute.* You might travel through some ridings for six months without knowing that there is such a thing as a Farmers' Institute in existence. There are other ridings which you can hardly enter without hearing that the farmers of that locality have among them a very important and useful organization known as the Farmers' Institute. The difference is all due to the officers, especially the secretary. Again, when you go to some places to assist at an Institute meeting you cannot find a solitary individual who knows anything about the proposed meeting. You begin to think that you may possibly have made a mistake in the place or the date. You look round and round for some public announcement, but can find none. At length, after enquiring and searching for a time, you come across a little hand-bill about a foot square on some out-of-the-way wall or post. So far, so good. The hour announced for the meeting arrives; and you make your way to the hall, fully expecting to meet a fine audience of farmers; but, to your surprise, you find the place locked. You then hunt up the caretaker and commence to abuse him; but he soon brings you to time by politely informing you that, up to this hour, no one has instructed him to open the hall, and such a thing as heating had not been mentioned by anyone. You help to start the fire and after a while the secretary puts in an appearance. He seems pleased to meet you and expresses his disappointment at the smallness of the audience. On inquiry, you find that he sent the bills to John Smith and requested him to put them up; he naturally supposed that some of the local men would look after the hall; and he thought he could arrange about the music for the evening meeting during the noon hour or sometime in the afternoon. He sallies forth at noon, and, to his surprise, finds that most of the local singers have other engagements. The result: A small attendance, no music, and a partial, if not a complete, failure. That Institute needs a new secretary, and perhaps a new president.

To Institutes everywhere I would say, if your secretary is inefficient, dispense with his services at your next meeting. Continue to change until you get a good one—one who understands how to advertise and work up a meeting; who will canvass for members, answer correspondence promptly, and give personal attention to the details of his work, instead of entrusting them to others. When you get such a secretary pay him for his services and keep him from year to year.

If you have any other officers who are doing little or nothing to advance the interests of the Institute, give them an opportunity of resigning at the earliest hour possible.

Local Talent.—From the first, I have maintained and am still of opinion that no Institute can live, grow, and do good work, if it fails to bring out and develop its local talent. An Institute that is always waiting to be spoon-fed by people from abroad, never amounts to anything. It is all right to get outside help occasionally, but not to rely upon it for the whole or even the principal part of the work. It is, in my opinion, very much better to bring out your own men, develop what is in them, become self-reliant, and use outside men only as assistants. In some respects, the papers of local men are the best you can get. The thoughts may not be very elegantly expressed; the diction may be faulty, but they contain the experience of the men who are working under the conditions which exist in your locality, and for this reason they are often of much greater practical value than splendid essays or brilliant addresses by men from a distance.

I regret to observe that the Institutes throughout the Province are showing a disposition to rely more and more upon outside help. The heads of nearly all the deputations sent out last month report that very few papers were read by local men. It was quite different a few years ago, and I attribute the retrograde movement to the very general change from two-day to one-day meetings. At first we spent a full day and a half, or two days in each place. Latterly the demand has been for single-day or half-day meetings, two in each riding. This, I think, is a great mistake. It is a waste of money to send three men to a place and keep them only one day; and to restrict them to half a day, is to play at Institute work. A winter afternoon affords no time for local papers, little or none for discussion, and only about half what should be given to the members of the deputation. I think we must insist on two-day or day-and-a-half meetings, local papers or addresses, and ample time for discussion. If you want outside help at different points, make an annual change in the place of your January meeting.

Deputations to Winter Meetings.—The farmers and their sons are growing shrewd. Becoming more and more intelligent every year: and they can no longer be persuaded to spend their time in listening to stale platitudes which they have heard or read a score of times. They will not put up with mere talk. They want pithy, practical, instructive papers or addresses; and nothing else will command their attention. Herein we must have good men for the winter meetings—not mere writers or talkers, nor visionary theorists, but able, well-informed, practical men, who have something to say and know how to say it. Such men are scarce and hard to get. Only a few of the best men are available for such work. For years past I have tried to induce some of our leading specialists in the different branches of farming to assist at these meetings, but in vain. They cannot spare the time, do not care for the work, or have to attend the annual meetings of certain associations within the weeks set apart for our winter campaign.

We can get plenty of men who are ready writers and fluent speakers; but, in my judgment, mere writing or speaking counts for little with farmers. If a man cannot point to his own practice in support of what he has to say. Farmers are practical men of strong common sense; and I do not know of any other class of people who have such an utter scorn and contempt for preaching without practice. What use is it for a man with a dirty farm to tell an audience of farmers how to destroy noxious weeds, or a man with a mortgage on his farm to read an essay on feeding hogs or raising sheep for profit? Such exhibitions are worse than useless.

Again, the great majority of the very best farmers—thoughtful, intelligent, thoroughly practical, successful men—are no use on a public platform. They can

neither speak nor read papers. Hence the difficulty of getting the right type of men for Institute work. We can obtain the services of some such men at home; and it may be advisable before long to spend the money necessary to bring a few from the neighboring republic—men of acknowledged merit, whose services will cost about $5 per day in addition to their travelling expenses.

Hitherto I have sent one or more College men on nearly every deputation, for two reasons: (1) In order to keep the College in touch with the farmers; (2) because professors and other college officers receive no pay for Institute work. But the use of College men to such an extent can be discontinued, if it is thought advisable to do do. None of us will find fault with any change that may be made in this direction.

Money for Institute Work. Hitherto I think we have done good work, and I believe that for the money spent we have done more than any other province or state on this continent. Last year we held 119 meetings in January and 12 in February, making a total of 131 regular meetings, in addition to a considerable number of dairy and special meetings attended by Professor Dean and others sent from the college throughout the year. This year the number of regular meetings is 158. This series of meetings as already intimated, covers the whole Province, except Haliburton, two ridings in Hastings, and one in Durham. To attend these meetings, thirty men were on the road for the first three weeks in January; and another deputation will shortly visit Muskoka, Parry Sound and Algoma. The travelling expenses of these men have to be paid; also something for printing and postage, and a certain allowance for the services of all except those who are connected with the college. And the total sum voted for the purpose is $3,500.

At the last session of the Legislature, the amounts voted for Institute work were as follows.

For printing, postage, expenses and services at winter and other meetings arranged for by the President of the College	$3,500 00
For advertising and other expenses of local institutes	2,200 00
For Central Farmers' Institute	1,200 00
Total	$6,900 00

To this should be added a considerable sum spent in printing and distributing reports.

The sum voted to cover the annual expenditure of Farmers' Institutes in the State of Wisconsin is $12,000—none of it for the local expenses of institutes, nor for any central representative organization, but all for the services and expenses of a director and of speakers sent from the University of Madison to attend meetings throughout the state.

The amount of money which we shall require in future will depend on the policy which we may pursue, first, in regard to the directorship, and secondly, in regard to the number of meetings to which we shall send speakers.

1. Shall we extend the time of institute work, and arrange to send out speakers in January, February, March, June, October, November and December—seven months in the year? If so, we shall need more money.

2. I am now inclining to the opinion that it would be advisable to send only two speakers to the regular winter meetings, and send one, when requested, to meetings held at other points and at earlier or later dates. If this is done, we shall require more money.

3. For some time past I have been in favor of having a three-days', or a two-and-a-half days', round-up meeting each year, immediately after the regular winter meetings. I would hold this meeting east one year and west the next, alternating from year to year. The speakers at this meeting would consist of men selected from the deputations just returning from the regular winter meetings, with the addition of some distinguished men

from abroad. The proceedings would be fully reported, and the papers, addresses and discussions published in a volume for distribution among institute members throughout the province. If such a meeting is held, more money will be needed.

The Directorship. During the last ten years I have been a sort of self-appointed Director of Institutes. For the reasons stated on the first page of this paper, I voluntarily assumed the responsibility in the fall of 1884; and from that time to the present I have done the work with the tacit consent and approval of the Government. All along I have, of course, consulted the Minister immediately over me and have considered myself under his control in this as in all other matters connected with my work as President of the College.

So far we have got on nicely. Good work has been done by the institutes; and we have had no trouble or friction of any kind; but I think the time has come for a change: (1) Because the extra work in connection with our Dairy School, the Summer School Teachers, the Institutes and the Travelling Dairy is so heavy and involves so much care and responsibility that I must either have some assistance or be entirely relieved of the institute work; (2) Because the institutes need more time and attention than I can give them under present conditions.

A few weeks ago I was disposed to ask the Minister for entire relief from this work; but some of my colleagues think that it would be a grave mistake for me to do so, inasmuch as it would be a virtual severance of the connection which has so long and happily existed between the College and the Institutes. Owing to my position, I understand our professors, teachers and lecturers better than any one else; and to a considerable extent, I control their time. Hence I can utilize the college staff for institute work in a way and to an extent which no other could; and there is no doubt the college is largely benefited by its direct connection with the institutes. Those who view the question from these standpoints think it best that I should continue to direct and have the assistance of some one at the college who would give the greater part of his time to institute work. Others who have thought carefully over the matter, have no doubt come to different conclusions.

Mr. Fiehe: The point that we arrived at was to ask the Central Institute or somebody to send us one men, say in February or March, and commence in our riding and go in about four or five school houses; one meeting one night at a certain school house and another night in another school house, and keep the man through that week. In that way we concluded we could reach the men that know everything. We have come to the conclusion if you send us one man on the dairy business and a man on sheep or cattle we would try to make up a meeting amongst ourselves; and I think in that way we would have a large meeting some place.

Pres. Mills: Would you be in favor of sending two in January and one at other times?

Mr. Fiehe: Yes; two are plenty.

Mr. Phillips: The suggestion of President Mills I think a good one. I like that plan of having only two men and then having a second or third meeting. And about holding the meetings in the villages. I find that the smaller the place the larger the meeting.

Mr. Clarkson: I have listened with a great deal of pleasure to the address of President Mills, and I feel that we should devote a good deal more of our time to this subject of Farmers' Institute work than we are doing. I agree with the suggestion that we should only have two men at our January meeting. As to advertising our meetings, I have been for some years secretary of our institute, and I have found by experience that it pays to advertise. We spent a great deal more this winter in advertising than we ever did before, and we took particular pains that our advertising should be thrown in the proper channels, that our bills should be sent out early in the season, two or three weeks before the meeting is to be held, and we spread around these dodgers promiscuously so that everybody would know, and the result was that our institute meetings were the most successful we have ever held.

Mr. ZAVITZ: I was very much interested in the paper read, and I know some thing of the difficulties spoken of by President Mills in reference to the Institutes. Now, we are not satisfied with one meeting in the winter with the help of this deputation. We want at least two or three points in our constituency at which we can have that deputation; and that is one cause of the shortening of our meetings, in order to get the deputation at different points. I am thoroughly in favor of advertising. We get out our large bills two or three weeks before the meetings and then shortly after we get out the programmes so that we can follow them almost to the letter. I think that is a very important thing. I find it of great importance to send these bills directly to the best farmers within reach of the Institute. We send out probably 100 for each meeting, or not as many probably for some of them, but we have 400 bills printed for our four meetings. Then we must have more Institutes. One or two in a county is not enough, there should be one meeting in each township in the winter or during the year. I think the winter season is the only time we can hold them successfully; January and February are the best months for us. We arranged for the Travelling Dairy in the latter part of summer, and we had a very successful meeting, but for the meetings I think winter is the best season.

Moved by D. McCRAE, seconded by T. KELLS, "That this meeting endorses the suggestions made by Dr. Mills, viz., two day winter meetings with two delegates and a third delegate to help at other meetings during the season. They also approve of a general meeting or 'round-up' at or after the close of the winter trips."

Mr. HUNTER: The June meeting is very good; we have had it since we started—and I think our January meeting was our eighteenth meeting—we have it in June with local talent, and we have got along very well. Still, we would like to have one of the professors with us at other times. I think the farmers should have more farmers' clubs in the different school sections. It was through the farmers' club that we got the Institute in the first place, and we have kept the club still going. And I think if the farmers would talk more together at home, just their own experience, how they got along with such and such things, it would be better for them, and the speaking would not be left to the same ones to do over and over again.

Mr. McCrae's motion was then put and carried.

Moved by T. G. RAYNOR, seconded by R. F. HOLTERMANN, "That it is the opinion of the Central Farmers' Institute that owing to the magnitude of the Farmers' Institutes the time has arrived when the Provincial Government should give President Mills an assistant to help him in his work in arranging for institute meetings."

Mr. RAYNOR: I know the difficulty of the task that Dr. Mills has to get each deputation at the place with the least expense, and the number of Institutes which have to be arranged for, and I think it is an injustice to him in his work. I would not favor the taking of those institutes away from the College, for I believe it has done the officers of the institution good in the way of giving practical instruction to the young men who are attending.

The motion was then carried.

Mr. EWING: I would suggest that a shorthand reporter accompany the delegation sent from the Agricultural College in January and that he take note of all the papers read at the local institutes, especially those read by local members, with the discussion, and have these all collected together in a large book something similar to the report of our Central Institute, and sent to the farmers' institutes through Ontario. I believe it would be a very interesting book and a source of a great deal of information.

President MILLS: That would involve the appointment of ten stenographers, which would be very costly. It would be quite desirable if we had only one deputation, but we have ten. The Minister of Agriculture, feeling the difficulty that you speak of, suggested the publication of a volume last year, and actually did publish one, made up of papers collected by the heads of the deputations as they passed from place to place.

Mr. Beam: In connection with this discussion I would like to just give a little idea of how our neighbors across the Niagara River do their work, that is in Niagara county. We have been exchanging speakers, and I find that over there they have a system of meeting the last Saturday afternoon in every month. The ladies take the matter in hand, and when they do that everybody and their friends attend, and it is for this reason that 25 cents is generally paid. They get up a supper or dinner as the case may be for the benefit of the church in the neighborhood and they all cheerfully come, boys and girls, young and old, every class. They have eminent speakers sometimes from different parts of the state, and it is marvellous what results they have brought about. We have been endeavoring in Welland County to try to get their system of getting hold of the people. They have succeeded admirably and I wonder why we can't get the crowd.

ADDRESS BY THE MINISTER OF AGRICULTURE.

Hon. John Dryden then addressed the meeting as follows:

I have been very much interested in this discussion, and I think it is perfectly right that this Institute should tender a vote of thanks to Mr. Mills, not merely for the paper he has read but for the work he has done in behalf of these institutes all these years. Now I want to tell you what you don't know, that he has done it all without any extra remuneration, while I happen to know that he has probably spent two months in the year wearying his brains trying to get at these secretaries who won't telegraph or write and won't say where they want the meeting, and after he gets them all arranged he gets a wire at the last moment that the meeting has got to be changed. Then he cannot regulate the trains in getting the deputation there. It is a wonder to me that President Mills has undertaken this work all these years without getting anything at all for it, for he had quite enough to do without, and I hope the institute won't forget this, in giving him a vote of thanks.

I think you will all be benefited by the discussion you have had in reference to this subject. There is no doubt in my mind it is not merely the papers that you read, but rather the discussions afterwards that accomplish the most good, and unless you can bring out your local talent—unless you somehow manage that these local men will open their mouths and tell what they know and ask what they would like to know—you will fail very largely in your institute work. But, I believe, having listened to this paper and discussed this matter with the officers of the institute, you will go back again to your various electoral districts and do better work another year.

Another thing I would like to impress on you is this: We find in my Department that the names of the members of these institutes change almost entirely year by year. Now, why is that? I know the reason why very well. It is because the directors of the institute do not trouble themselves to get members except at the meeting. You go to that meeting there and you have a number of farmers just around in the district, and your membership is entirely composed of those men. The next year these men are dropped altogether and you have another lot, and so on. Now, I don't like that, because I have been seeking to do some good in another way. I have been seeking to send these reports and bulletins to these members of the farmers' institutes from my Department, and I dislike very much to lose old members. I would rather that directors would take it up something like we used to do in connection with our agricultural society, when we vied with one another, when we were all enthusiasm, in getting members to join, and I have gone into the meeting with 100 and 120 members from my district. How did I get them? Just by moving around with a horse and cutter at this time of the year inviting men to become our members. We ought to have three times as many members as we have now. Let us stick to our old men. I believe they would all join if they were only asked, but the secretary is away off somewhere and they don't see him, and so the names are lost. I hope you won't forget that point when you go back, and attend to your local institute work.

I was just thinking how rapidly the time has passed away. I can scarcely realize that a year has elapsed since I met you at your last annual meeting. I suppose it is because I have been very busy; and I apprehend that most of you have been busy too, but perhaps in another way, and I doubt not that most of you have spent the year in toil and anxiety on your farms. I was thinking while I was sitting here that I wished I could congratulate you all on a more abundant reward for your labors, but unfortunately the value of products which you produce on your farms has now in some cases got so low that it does not amount to sufficient to pay expenses. But I think I can congratulate you on the fact that through the beneficial influence of these same institutes, their educative influence on our various agricultural organizations, coupled with the increasing usefulness of our agricultural press of this province, we can now see visible signs of improvement all over the province both as to the quantity and quality of our various farm products. We are certainly increasing the output of our cheese very largely in this country, and what I like more than that to see is that the quality of it is quite equal, if it is not superior, to that which we have manufactured at any time in the previous history of the province. But perhaps still more remarkable is the increasing quality of the butter product of this country, which is due to the instruction and information which has been given through the various channels of which I have just spoken. And it does seem astonishing when we think of it that notwithstanding the times of depression in which we live, speaking from an agricultural point of view—notwithstanding the fact that in this province we are producing largely increased quantities as compared with previous years, that the price of these dairy products remains quite as good, if it is not enhanced, during recent years. Our farmers, in order to produce more of these dairy products, are giving more and more attention to the selection of the animals which it is necessary for them to own in order to accomplish this result. They are thinking, studying, discussing, at these institutes more and more the proper care which should be given, the proper kind of food, the food which will bring about the very best results in this direction, and I may be permitted to say that there is no doubt that we have succeeded in live stock and in any of these particular lines; that, I think, we have proved by the record we have made at the great Chicago Exposition. But what I want to impress upon you is the desirability of continuing the work of this organization until it shall come to pass that the average of our animals all over this province will be equal to those which we see in some quarters at the present time. Now, besides these dairy products we are sending abroad annually the very best beef, mutton and pork which the best markets of the world demand; and although it is true that some of our horses to-day are practically valueless, yet it is still true that we do send away a limited number from this country which command the very best prices on the American continent at any rate. Our fruit and our honey are better known to-day than ever before in the history of the province. During the Chicago Exposition we made such an impression upon the outside world that we are going to have, for some of these articles, customers who never knew anything about us at all before. The fact is I have made up my mind that concerning all these different departments we are just beginning to realize what the possibilities of this province are in reference to the development of this great agricultural industry which you here represent. We are more and more beginning to realize that in this business of agriculture as well as in any other business it is better that our farmers should have some particular line of production which they would make what you call a specialty; with one, dairying; with another, fruit; with another, live stock, and so on,—some specialty to which he might add as his circumstances would permit. I fancy if we would do best for ourselves in the future that we must realize more and more what we have to follow along these lines, and that means that the farmers of the country will think out for themselves what is best for themselves. It happens that I cannot give you that sort of information, and I don't ask you to give it to me. I am prepared to think it out for myself, but I find that my peculiar circumstances will warrant me in following out some special line perhaps entirely different from that which is followed by you. We were talking about dairying just now, but perhaps it will not be best for some of us to follow dairying. Some of our city people think it is so easy to make money in dairying and all our farmers ought to follow that, but there are dairymen here and they know the truth of what I say, that what

you get by that you get by hard work. The only thing that you can say about it is that a man who does labor in that direction gets some pay for his labor, and when he labors in some other directions he perhaps does not. We are becoming more and more seized with the conviction that old plans and old methods must be discarded, and must give place to something in which we can see a better return for our labor. And I believe we could make very much better progress along this line if we could only have held out to us some brighter prospect of a reward for our labor in any of these various directions.

There is no doubt of it, and there is no use of you denying it, the hope of gain is, after all, the highest incentive to induce us to put forth greater efforts in any particular line of industry. A man because he can gain something by it will make great efforts to produce perhaps a better quality or a greater quantity. If 15 cents would represent properly the labor and the food and the other expenses incident to the production of a pound of butter it is very easy for any of us to see that if you make that pound of butter worth 25 cents, by the additional 10 cents a pound you have produced the strongest argument it is possible to put a man to induce him to make greater efforts in the production of a better article. There is no doubt of it. On the other hand, I suppose by the same rule if you decide that there is 70 cents worth of labor, etc., expended in the production of a bushel of wheat, if you reduce the price to 60 cents it does not take much of a philosopher to see that in so doing you have destroyed all hope in the producer: you have brought to him discouragement and you have put him in a position where he is almost certain to adopt looser methods instead of better ones, which will bring about a great deal worse results. So that I make this point, that if we could contrive in any way to enhance the price of our articles, we would then have better farmers all over the country and the very best argument to induce them to make better efforts than they have ever done before. Now, unfortunately, during this year the value of our products has still gone down and it is going down yet, and men are asking everywhere, "When will this reduction in value cease?" We hear it said in the papers occasionally that now the bottom is reached, but in a few days we find there is a bottom still farther down that we are trying to find, and so on and on it goes until one is almost alarmed at what is likely to be the result. But there are some who tell us that the values are just the same as they have ever been; you don't get the same prices, but it does not make any difference, the value is just the same. What I presume they mean by that is that the same number of bushels of barley will purchase the same number of bushels of wheat, or it may be the same number of bushels of wheat will purchase any given acre of land. They mean that the value has gone down all round; if everything has gone down in value equally, they say, you have no cause to complain, you are just as well off as you were before. My answer to that is very plain. The fact is some of these people forget that all these products which you and I are bringing forth on the farms of this province represent labor all the time; and I want to say this in the hearing of anybody who has imbibed that notion, that the labor necessary to produce these articles has not been reduced at all, it is precisely the same as it has always been. For a number of years I don't think our farm labor is reduced one particle so far as I am aware. I wish I could answer this question satisfactorily to myself, "Why are we in this day in which we live obliged to see realized the constant and continuous reduction of values?" It is not merely in Canada or in the United States, but the world over there is a great reduction in values, and there must be some reason for it; and I apprehend that I will find a dozen men ready to spring up and give me the correct answer in half a minute. I have suggested it to people in conversation everywhere, and I have always got the same answer. "It is over production," they say. If that is the case, then I think I am wrong in trying to induce the farmers of this country to produce more, for it is only going to make matters worse. But is that the case? The fact is there are people starving for want of something to eat. We are told that there are three or four millions on the American continent to day who are being fed on charity. It is not the lack of food, for there are millions and millions of bushels of wheat stored in the elevators. But what is the matter? What means it that we have an abundance, and over production, of clothing which is being forced on the market and being sold perhaps at a loss to those who have manufactured it, and yet there are hundreds of thousands of people all over the country who would be delighted to purchase

some of that clothing but they can't do it? It is not the fact that they have lost the desire to purchase, but they have lost their ability to purchase ; there is no doubt about that. Perhaps we can get the best answer by just asking ourselves. Why can't I purchase? Suppose you put it to yourselves, "Why can't I purchase more or as much as I could five years ago?" The answer, it appears to me, is just this: The value of our staple products, valued according to the standard, for there is one standard of value for all these things, is so reduced that they will scarcely pay the expense incurred in their production, and consequently, on the other hand, there are certain times at which we are obliged to make certain disbursements which are not reduced a particle. I venture to say that our taxes, direct and indirect, remain just the same, but it takes a good many more bushels of wheat or a good many more lambs this fall to pay them than it did before. The wages or the labor required in the production has not been reduced either ; and if any of you should be so unfortunate as to be indebted to anybody you will find the interest is just the same as it was before. The value of these latter things I have mentioned remains precisely the same, but the value, according to the one standard, of the others has been so reduced that the fact is by the time you have paid these necessary expenses, which cover most of the expenditure beyond a bare subsistence, there is nothing left, and consequently under those circumstances the farmer has lost his power to purchase and cannot do it. Now, if the farmer cannot purchase as he did, of course it does not take very much thinking to see that the manufacturer who is producing articles for his special benefit will have to cut down the supply; he will have to close up at least part of the time: and so the mechanic loses his employment, and his purchasing power is gone. And if capital is not remunerative when employed it will very soon lie idle, and then the laboring man loses his employment, and so in turn loses his purchasing power. That shows that it does not take a very wise man to see that sooner or later we shall come to certain distress.

I should like very much to give some remedy for this. There is no doubt at all that if one could contrive some scheme whereby the masses of the people could be brought again into a condition in which their purchasing power would be brought back to them we would soon have the wheels of industry revolving as they were before. Although we cannot control the prices of our products, yet to me it is a very interesting topic of discussion, and I have been thinking a good deal about it latterly to see if I could not find out what is the matter, because we don't seem to come to any end. Values are being so reduced that some of our best men in our part of the country are going down. These are men who have branched out, bought an additional number of acres, put a mortgage on the farm, and thus have got a little behind, and they are bound to go under, —there is no help for them that I can see.

But there are some who boldly say to us that it is not the reduction in prices that is the cause of this depression so much as it is the advance in the value of that which is recognized the world over as the standard by which we are controlled, or in other words what they mean to say, to put it plainer, is that the common standard accepted by the world, which is simply gold, is enhanced in value,—that instead of your products going down it is the other that is being enhanced or appreciated—and when I find a man like Hon. Mr. Balfour talking in this way I begin to wonder whether this is the case or not. It is perhaps too big a question for you or me to settle very easily ; it requires a great deal of consideration and discussion, but I can easily see if it could be settled in all our minds that that is the reason. It means simply, I suppose, that there is not gold enough just now that it is decreasing in volume so that there is not enough to carry on the commerce of the country. Now, supposing we could decide that that is so—I am not saying it is so, I am only giving you the suggestions of other people—I could easily understand that then probably we should be divided into two classes. One class would say, "That is just exactly what I want to see ; I am living on a fixed salary and my salary is worth more to-day than it was five or six or ten years ago ; I don't care whether it goes down and down." But while that is true concerning that man it is certainly true that those who are the producers, who are laboring day by day, are put in exactly the opposite position. And if I decided in my mind clearly that that is so, I should not be a great many minutes determining which side I would take.

I should certainly take the side of the producer and the laboring masses of this country. This is perhaps rather a big question to discuss in a farmers' institute, but it has been in my own mind, and I hope you won't come to any conclusion or pass any motion adopting my suggestions, but just think about it. I don't care what conclusion you come to—think about it. But in the meantime, what are we going to do? Some of the people about town tell me we have got to let agriculture go now and try and develop our minerals and something else, but no matter what these people may say, you and I are bound in our own interests to do whatever we can to increase the production on the land which we are now occupying, and we are bound to use all these instrumentalities and all these organizations to get what information we can in order to enable us to do better than we have ever done before.

I am delighted in this day and age to realize that the producing classes are working together perhaps in greater harmony than ever before in the history of this province. I am delighted to find that they are beginning to realize that their interests are identical. Some of our people don't like it very well, but I am delighted myself to see that the people in the rural districts are beginning to take it into their heads that they ought to make up their own minds what they ought to do in respect of various matters which are being submitted for their decisions, and I can say, speaking for myself, that I shall hail with a very great deal of delight the day which comes to the Province of Ontario when our people shall have such facilities for education that they will be enabled by themselves and for themselves to form a correct conclusion and to give a correct judgment in reference to any subject, whether legislative or otherwise, which may be submitted for their decision.

Moved and seconded that this meeting tender its sincere thanks to Mr. Dryden for his address, and to Mr. Mills for his exceedingly able and instructive paper. Carried.

Mr. Mills: I may say that I appreciate your vote of thanks, and the kind words expressed by the Minister of Agriculture in regard to the work I have endeavored to do for the Institute. I explained at the beginning of my paper why I undertook the work, because of the distance which seemed then to be between the College and the farmers of the country. I am glad to see now that the distance is not so great, and that these meetings are a source of great pleasure and profit to us. I cannot express the pleasure it is to me to meet farmers from all parts of the province, and to feel that I understand them to a large extent and they understand me and other members of the staff who are endeavoring to the best of their ability to serve them. There is one thing I would like to suggest, that is that by some means or other you would arrange not later than the 1st of October or about that time to decide where you are going to hold your January meeting. I had the greatest difficulty in getting the list of the places for the January meeting, and some secretaries still keep me back. I cannot write enough letters or send enough telegrams to get a reply from some of them. I sometimes write to the secretaries saying "If you wish help, notify me at once and name the place of your winter meeting." I will wait two or three weeks and get most of the answers probably, or probably I have to wait three or four weeks for some of them, and they say they do wish help but say nothing at all about the place of meeting. Then I ask them to name the place and they write back and name five or six places, so I have to write again. In this way three or four secretaries will keep the whole institute back. You must have the whole thing right before you before you can begin to arrange a programme for the province. Now you ought to be able to decide it in the month of September, and I can do you better service with longer notice and put things in altogether better shape for you if you will without exception send in the list not later than the 1st of October.

Mr. Drury: I would like to ask Professor Mills if the winter meetings are to be held for two days in every place: if this is to be a cast iron rule with no deviation from it? If that is the purport of it I think it will lead to a little trouble in some cases.

Mr. Dryden: If the resolution is acted upon it means, just as President Mills has said, more money. Now, before he can decide on that I shall have to ask the Legislature whether they are willing to give us more money. What I said a little while ago about each of us as individual farmers applies equally as well to each individual institute: what

suits one will not suit another. And although on general principles I quite agree that two day meetings if carried out would prove better in some cases, it might not be wise to make any cast-iron rule.

Mr. JAMES SMITH: Owing to the peculiar shape of our constituency it was suggested that we hold meetings in two different places in January; now can we expect a two day meeting at each place?

President MILLS: Not as a rule.

Farm Help. Moved by JAMES SMITH, seconded by JOHN HUNTER, "That whereas on a former occasion this Central Farmers' Institute took initial steps to supply the much needed want of suitable farm help, and so far succeeded as to receive the information from the immigration agent that he had over one hundred fine young men ready to supply the said want; and whereas from some reason no arrangements had been made to receive the said help and the matter was allowed to drop; be it therefore resolved, that the Executive Committee take this matter into their most serious consideration, and by entering into communication with the secretaries of the local institutes or otherwise see if something cannot be done to fill this much needed want." Referred to the Committee on New Business.

Vote of Thanks. Moved by J. B. MUIR, seconded by T. G. RAYNOR, "That we, the members of the Central Farmers' Institute, in convention assembled, desire to place on record our appreciation of the work done by the Hon. Mr. Dryden, Minister of Agriculture, in advancing the agricultural interests of this province, and especially for the distribution of the agricultural literature to the members of the Institute, and for his great interest in the dairy interests of this province." Carried.

The meeting then adjourned.

THIRD DAY—THURSDAY MORNING SESSION.

Business was resumed at 10 a.m., the President in the chair.

Statute Labor. Moved by R. A. JAMIESON, seconded by WILLIAM GIBBONS, "That, in the opinion of the Central Farmers' Institute, one-half of the statute labor should be performed in the winter months."

Votes of Thanks. Moved by Mr. MOWBRAY, seconded by Mr. SMITH, "That the thanks of this Institute be and are hereby tendered to Mr. Thomas Lloyd-Jones and Mr. Thomas Kells for the very efficient and faithful service rendered by them to this Institute during the past year, and also to tender their sympathy to Mr. Jones in his present illness, and express the hope that he may soon recover his usual health." Carried.

Moved by THOMAS KELLS, seconded by Mr. SMITH, "That this Central Farmers' Institute of the Province of Ontario do hereby tender thanks to the Hon. Mr. Angers, Minister of Agriculture of this Dominion, and the Hon. Clarke Wallace, Controller of Customs, for the very courteous manner in which they received the deputation sent by this Institute last winter *re* tariff reform and other grievances, and for the assurance guaranteed by the said honorable gentlemen representing the Government of Canada that all matters laid before them by the aforesaid deputation would receive careful consideration by the Government." Carried.

Superannuation. Mr. PRINGLE: There was a resolution brought up yesterday with regard to superannuations, and withdrawn on account of it not applying to the province. I therefore move, seconded by Mr. MCDOUGALD, "That in the opinion of this meeting it is desirable that the system in regard to the superannuation of officials in the service of the Dominion Government should be abolished." Carried.

Agriculture in Public Schools. Moved by ALF. BROWN, seconded by ALF. HUNTER, "That this Central Farmers' Institute deem it advisable to make the study of agricul-

ture compulsory in the public and high schools throughout the Province of Ontario; therefore be it resolved, that a deputation from this Institute wait on the Ontario Government, in order that we can secure such legislation at as early a date as possible."

Mr. GEORGE A. AYLESWORTH: The same matter has been dealt with by the Educational Association of the Province of Ontario, and the Minister of Education has been approached on the subject, and he has told what is the policy of the Department. It is held that it is not advisable to make it a compulsory subject. If it is left as it is now, to be encouraged in every way by trustees and teachers, more good is likely to be accomplished than if you place it on the compulsory list.

Mr. RENNIE: We all know for a fact that the way it is left now, not being a compulsory subject and very few of the teachers wishing to go into teaching agriculture, it is simply dropped from the list, and unless it is made compulsory you may as well strike it out altogether.

Mr. MOWBRAY: It is hardly fair to make it compulsory in all our public schools; it would be unfair to the children of mechanics and artisans, for as a rule they follow the vocation of their parents. I think it would be a move in the wrong direction, for there is not 5 per cent. of the teachers in Ontario qualified to teach it.

Mr. GOODWILLIE: I fully endorse the remarks of Mr. Mowbray; I think to make it compulsory would be very hard on the people in the towns and villages.

The PRESIDENT: It would appear that this matter is now entirely in the hands of the rural school trustees to have it taught in the schools if they see fit, and I don't know that it is wise to change the present condition of things.

Mr. DRURY: I think the Government is doing all they can to help along this movement as to agricultural education. I would just simply remind the gentlemen of the action taken by the Minister of Education in regard to providing a course of instruction at the Agricultural College. To make it compulsory would simply mean that it would be very illy taught and would bring the whole subject into disrepute with the people.

The motion was then voted on and lost.

REPORT OF LEGISLATIVE COMMITTEE.

The report of the Legislative Committee, the discussion of which was laid over from last night, was then taken up, Mr. Raynor reading it.

Clause 9, being the first clause in the second report, was that the committee recommend that Mr. Clinton's motion re the French treaty be adopted.

Moved by Mr. RAYNOR, seconded by Mr. STEWART, that clause 9 be adopted.

Mr. FISHER: I say it is unfair to a body of men of this nature to make them appear ridiculous before the people of the Province, as this would do. For the last half dozen years we, as farmers, have been passing resolutions favoring free or freer trade with all nations, and now when the shoe pinches us on one little point, whereby we hope to exclude French wines, we are posing as protectionists, and I ask the gentlemen present to vote down the resolution.

Mr. CLINTON: As the mover of that resolution I might say, and no doubt it is unnecessary to say, that the substance of the French treaty is that if we allow certain cheap French wines to come into this country, that we will get access to France in the way of deals, woollen ships and fish. In return for that we get a cheap grade of wine, a wine that is not made of grapes alone, either. Now, if we are going to drink wine we want to drink the best that is made, but as we have a tendency towards prohibition it is not likely we will want much wine at all. This is a new industry, the growing of grapes all along the borders of Lake Erie, and as a branch of agriculture I think it should be protected. If we were gaining anything by having access to France I should say let us have it, but we are gaining very little. If our

friends would spend more time negotiating treaties of this kind with our American cousins we would be better off. I think we have nothing to lose in passing this resolution, and a good deal to gain. The Government may put this into effect if we don't take some action in the matter, and I think we ought to support them in this way.

Mr. SHEPPARD: The question is whether we shall give France a certain amount of freedom which other nations do not possess. If we were going to talk about making all wines free, that would be something in the line of free trade, but I don't think this question is affected in that way at all. This is a direct bargain made with France that under certain conditions their wine shall be introduced into this country at a less rate of duty than other nations pay. The wines from Spain and Germany will not be admitted at any less rate; simply the wines of France, which we all know are about the poorest in the world. On the other hand, there is a very great amount of capital invested just now in the grape industry, and of course if the policy of the Government changes to one of free trade we who are in the business will simply have to put up with it, but we don't think it fair that the industry we have taken the trouble to build up should be just knocked out, as it were, to favor the introduction of low, cheap wines from France.

Mr. PRINGLE: This is an important question; there is a principle involved in it. I have sympathy with the grape growers, but I cannot stultify myself by voting for that, because it would be a stultification. We are certainly, as farmers, aiming at freer trade relations with the whole world, consequently I cannot vote for the resolution. In regard to prohibition, if that comes in this country all wines will be excluded; it is for the importation as well as the manufacture.

Mr. A. H. PETTIT: At the present time we are importing from France over $200,000 worth of wine, and the duty collected upon that is 30 per cent. specific and 25 per *ad valorem*. Now, what are we doing as grape growers to-day? We are growing, in the Province of Ontario, 6½ pounds for each man, woman and child in the Dominion of Canada. Next year, according to the returns in the Bureau of Industries, we are going to produce 9½ pounds. If we are going to take off the duty on French wines it is simply going to take 7,000 tons that are manufactured into wine in Canada to-day and throw them on the market. It will not benefit the cause of temperance, and will injure the grape-growing industry of the country. We have got one of the finest grape-growing countries in the world, and the temperance people said to you yesterday or the day before that they don't wish the wine to enter this country; but the matter simply rests here—are we going to allow that wine to come in here in detriment to the grape-growers and the injury of this country? It is not protection or free trade; it is simply we are getting nothing in return that is of any value.

Mr. MAHON: I think, after the motions that were passed yesterday in favor of freer trade, we would be very much stultifying ourselves in passing that resolution now. It is certainly protection; if it is not I certainly am very obtuse. If the French wines are a very poor article and if we have one of the finest countries in the world for the production of grapes, and if the industry is increasing to such an extent as it is, I am very glad of it, but why are they not able to compete with the French wines on reasonable and fair terms? I hope that this intelligent assembly will not stultify themselves by passing that resolution.

Mr. MCCRAE: I am in favor of free trade on British lines, but I don't believe in free trade in liquor. This is protection pure and simple; it is protecting the wine of one country—giving it a special advantage in this land. Now, if we ratify that French treaty we have got to give a certain amount of time before it can be abrogated, and if we are going to have prohibition how are we going to do that? I am speaking for the ordinary interests of the country, and I am in favor of free trade with Britain, but I am not in favor of free trade with other countries unless they give us a fair show.

Mr. WOOLLEY: This gentlemen speaks about stultifying ourselves. Let us see where the stultification comes in. We have pronounced on prohibition; now if our Government

makes a treaty with any other country we can pass all the laws we have a mind to but we can't interfere with that, so that we are stultifying the temperance resolutions we have passed from time to time if we don't pass this.

Mr. HUNTER: I don't think we should bring this in as protection for the grape growers, but we don't want the stuff in here, and the best thing we can do is to keep it out.

The Chairman then read the resolution, and the report of the committee with reference to it was adopted.

Clause 10, in regard to Mr. Gurnett's resolution in reference to the width of roads was then considered, and on motion of Mr. Rayner was adopted.

Clause 11, re the Torrens system of Land Transfer, was adopted.

Clause 12, re the reduction of the Canadian tariff in sympathy with that of the United States, was adopted.

Clause 13, re railway passenger rates, was also adopted on motion of Mr. Rayner.

Legislative School Grants. The CHAIRMAN: There was another matter which should have gone to the committee, it is the motion of Mr. Stewart, seconded by A. P. McDougall,—"That in the opinion of this Institute the legislative school grant to Public Schools in the Province of Ontario should be increased, and that the executive of this Institute take immediate steps to secure this end." We may as well take it up now. The motion was then voted on and lost.

REPORT OF THE COMMITTEE ON NEW BUSINESS.

The following second report of the Committee on New Business was then read:

To the President and Members of the United Farmers' Institute:

Your Committee on New Business beg leave to report as follows:

1. That Mr. Hobson be allowed to read his paper on "Kitchen Gardening" provided the order of business will permit.

2. That Mr. Bowes be permitted to read his paper "The Farming Interests as one of the Divisions of Labor."

3. That the Executive Committee take the necessary steps to secure the carrying out of the suggestion contained in the resolution of E. Hawthorne re national week.

4. In reference to the communication of James Smith re farm labourers we recommend that the Superintendent of Immigration notify the Secretary of this Institute on the embarkation of any experienced farm labourers from Great Britain (in order that he may communicate with the secretaries of local institutes) of the time and place at which they are expected to arrive.

5. In reference to the resolution of Andrew Currie re weigh scale fees, your committee are of the opinion that as municipal councils under the provisions of the Municipal Act regulate the tariff of fees which may be charged by public weighmen that further legislation is unnecessary, but would recommend that municipal councils regulate by by-law such fees and have them posted in a conspicuous place near every such weigh scales.

Respectfully submitted,

A. P. McDOUGALL,
Chairman.

Toronto, Feb. 8, 1894.

On motion of Mr. McDougall the report was adopted.

Timber Lands. Moved by PETER STEWART, seconded by A. P. McDOUGALL, "That in the opinion of this Institute all settlers on timber lands in Ontario be entitled to all timber on their lands after buying the same."

Mr. MARKS: In reference to this matter, lands are sold to actual settlers, but the right to cut the timber on such lands has already been sold to lumbermen. Now, I don't think that as a representative body of farmers we would be right in asking the Government to take from the people what they have already paid for, therefore I think that the motion should not carry.

Mr. STEWART: We spend a great deal of money sometimes in inducing immigrants to come from the old country here and settle on these lands, and when they come here they find that they can't cut a stick of timber hardly on the lands they took up. Now if the law was changed so that when the land is sold to *bona fide* settlers the Government would settle with the lumbermen for that portion of the land, I think it would make immigration much better, as it is quite a hardship as it is now.

Mr. DRURY: I assure you that the question is by no means so simple as some of you imagine. If you propose to give the actual settler the right to cut timber, in a large part of this section where timber abounds it would simply mean that he would go in and take the timber and leave the land. I have had the opportunity of hearing this question discussed by some of the ablest men in this province, and I think as time presses and there is probably no opportunity to discuss this matter fully it would be better to defer it before placing ourselves on record. There can be no change now at the close of the Parliament, and it would be well to bring it up next year when due consideration might be given to it. In the meantime the members might obtain some information by which we could discuss it intelligently.

Moved in amendment by Mr. PRINGLE, seconded by JAMES SMITH, that this question be deferred till next meeting. Carried.

THE IMPROVEMENT OF OUR PUBLIC ROADS.

Mr. J. F. BEAM, of Black Creek, read the following paper:

Roadways in all parts of the world are at once both the means and the index, it is said, to the degree of progress and culture to which any people have attained.

In the earlier stages of civilization all transportation was carried on by footmen, or, when circumstances favored, by boats, like the Indian bark canoe or other simple craft. The next step in advance was pack animals, carrying both goods and human beings. Following the paths of footmen that were further worn by the feet of the beasts of burden, came the rudest possible roadways for wheeled vehicles, such as the natural surface of the ground affords. Step by step these routes were improved and more or less cared for between the main channels of communication, even in primitive times.

Gradually with the various social, economic and military demands of advancing civilization were developed those most wonderful highways of the Roman Empire, by which she attained and maintained her great prestige and power. These highways ran to Germany, Savoy, Hungary, Provence, Macedonia, Dauphane, Constantinople, along the Danube, and extended into England, Corsica, Sardinia, Sicily, Asia and Africa. At the time of Julius Cæsar the city of Rome was in communication with every large city of the empire by paved roads. Twenty-nine of these military roads extended out from the Forum, and nearly four hundred of the great highways crossed the empire a length of about fifty-three thousand miles. Consider, these were not common roads, but were paved throughout, and were noted for solidity. Many have been in constant use for nearly two thousand years, and in that time have often been tested by bearing loads of hundreds of tons, especially in the moving of obelisks and pillars, yet without injury. Pliny, the Roman author and lawyer, mentions the great strength of these roads, and the sewers underneath. They were built on scientific principles, and were always in the care of a man of great rank.

Later, in many countries about the beginning of the present century, the subject of road improvement received much attention, and to a marked extent also in our own. Macadam and gravel road companies were formed, and turnpike ways were built of ingress and egress for the scattered towns and villages and stage routes, to connect the more distant commercial centres. Some of these gravel roads, where toll gates have been removed, remain a valuable and permanent heritage at the present time.

The last advent of land routes is the most wonderful of all—the development of the modern railway, annihilating distance as it were.

Now it is a fact worthy of special note, that every advance in the method of land transportation has tended to destroy the earlier system of carriage. The plan of fortunen or the carrying of burdens on the shoulders of men was quickly replaced by the use of pack animals. The disuse of pack trains followed the development of ordinary wagon roads, and in turn the people have been more or less completely induced to neglect their wagon ways by the advent of the more rapid railway. The latter so absorbed public attention that every town and village became ambitious to have railway connection.

But experience has fully shown that quite excessive and unfounded expectations were entertained as to the extent of benefit that may be derived from railways. Had the many municipalities that bonused railways expended similar amounts on well-constructed Telford or macadam roads would not their material interests now be far more advanced? It was long thought that railways would become so general that no extended system of wagon ways would, in time, be needed. But it is now clear and abundantly evident that, owing to the very great cost of constructing and operating the former, they can never fully take the place of the latter. We must, therefore, turn our earnest attention again to the proper development and care of the

Old-Fashioned Highways.

But many of the old toll gate gravel roads, being built for speculation, and apparently costing only a few hundred dollars per mile, were not properly raised, graded or macadamized. The nearest gravel was generally placed in the middle of the road, in too many instances without regard to size or the securing that first of all requisites, a permanently dry and solid foundation by proper drainage. Consequently during the rainy season or when the winter frost is leaving the ground ordinary narrow tires, or even wider wagon tires, will drive the gravel down and badly rut and destroy the road. I had occasion to drive over forty or fifty miles of such gravel roads about a fortnight ago in Elgin and Oxford counties, just before attending the recent most successful and enthusiastic Dairymen's Convention at Ingersoll. On account of the open winter I found a continuous rut of three to six inches deep in the gravel, and yet toll gates and cheese factories were almost constantly in sight. The latter were all right, but the former were all wrong on such poorly constructed roadways. Such appears to be the condition of roads even in that justly far-famed dairy district, where the roads likely average as well or better than in any other part of our province.

Outside of the cities with their boulevards there is probably very little properly built and underdrained macadam or Telford highways in our country, and the average toll gate gravel roads in many places are only a means of oppressing the farmer.

All authorities agree that two rules must be followed in order to maintain good roads. "First, take the water out; second, keep the water out." With a properly constructed road the materials must bind together so compactly that the surface will shed water like a roof, and stand the destructive wear of all kinds of tires and weights of loads that it may properly be called upon to bear without injury. To properly build a macadam roadway, "broken stone from one to two and one half inches in diameter should be placed on the compacted bottom to a depth of three or four inches, and a ten or fifteen-ton steam roller passed over it four or five times. Then more broken stone of the same size should be laid on to a depth of three to four inches in the centre of the roadway, and two to three inches at the sides. This should be rolled by the steam roller until a hard bit of stone three to four inches in diameter, if it be placed on the surface of the roadway, will be broken by passing the wheel of the roller over it." By proper underdrainage an otherwise poor material will make a good roadway. Broken stone or gravel may constitute the wearing surface. But a harder kind of road-bed, such as is being used in New Jersey, Massachusetts and Switzerland, will wear more smooth and solid.

This brings us to the question of tires. Many persons think that the first step towards a road building and preserving agency should be to pass a general law regulating the width of tires, and that no road, however well constructed, will withstand the destructive effects of narrow wheels. The State of Michigan and other states and countries in late years, have passed such laws. But upon more thorough investigation it will be,

found of very doubtful utility ; and that any such regulation would be oppressive and could not be enforced in the present state of our highways. Over a century ago, when the highways of Great Britain were in much the same condition as our own at the present time, this question of tires was most thoroughly discussed and investigated, and laws regulating the width of tires were passed, most of which have long since been repealed. Thus we find we can turn to the long experience of England for valuable information and a proper example to guide us in road improvement, as well as in so many other respects.

Mr. Homer, writing in 1767, said " Broad-wheeled carriages are found to be so unadapted to the purposes of husbandry, the number of horses required for their draft is so great and the beneficial effects of them to the roads so questionable, that neither the encouragements on the one hand nor the discouragements on the other have been sufficient to bring them into general use."

Thomas Cadington, who had charge for twenty-five years of the roads of Wales, said : " Increased toll on narrow wheels did not prevent their use nor the carrying of heavy loads on them. The general laws were repealed in Wales in 1844, and in 1878 the ' Highway Act ' gave power to county authorities to make by-laws regulating the width of wheels in proportion to weight carried, and the power has generally been exercised. Effort has been made restricting the weight carried on wheels of less than four and one-half inches. It is certain that narrow wheels cause the greatest damage to roads, but it is difficult to enforce by-laws against them."

Macadam, in 1822, said : " The advantages of many existing regulations respecting wheeled carriages may very well be questioned. There can be no doubt that many of these regulations are oppressive to commerce and agriculture by compelling an inconvenient construction of carriages. I have never observed any great difference of effect on a well-made road by narrow or broad wheels. A well-made road may wear thin and weak but never rough, stony or uneven. Where roads are properly made very few regulations are necessary for their preservation."

The French engineers, Morin and Depuit, agree " that on a solid macadamized road in a good state of repair there is no difference due to the work of tires in the amount that can be hauled by a given team." The trained roadmasters of the old world also agree that with roadways of poor surface made up of materials so imperfectly united that they will not uphold a considerable weight, it is advantageous to have the tires of wagons, which are to carry heavy burden, of a width to a certain extent commensurate with the load hauled. The many advantages of wide tires should commend their more general use to teamsters, without any regulation being needed. An inexpensive wide tire, that can be made by any blacksmith, can be temporarily adjusted by inside flanges to any ordinary wagon. They can be used to great advantage when the roads are not too muddy. But it has been found that the width of tire is not the only important element in a wheel's formation. One foot added to the diameter will prove of much more benefit than an inch to the width of tire. Experience has shown that a load on a wheel six feet in diameter can be moved with one half the force needed to move the same load on a wheel three feet in diameter. " The difference is caused by the greater bearing surface of the large wheel, and therefore less sinking down into the road, which destroys a road." Other authorities state that when a road is in the soft condition so common in imperfect ways when the frost is leaving the ground, it is best that the wheel should cut down to whatever hard foundation there may be, rather than struggle with the soft material which is in its way. Even with the wide tire the bearing surface is pretty certain to descend to the base of the softened mass. In these conditions the narrow tire, because of the small section it presents to the mud, cuts its way more easily, and moreover it lifts relatively little mud in the spaces between the spokes as it revolves. On the other hand the broad tire, because of the width of its sections, the large amount of mud uplifted and in general its adhesion thereto, is very disadvantageous. It is indeed often possible to take a load over a muddy roadway on narrow tired wheels when it would be almost impossible to drag a broad tired wagon." Experience with an equal load, and on the same roadway, shows that a wheel six feet eight inches in diameter made but slight trace on its passage over the section of road, while a wheel four feet nine inches in diameter cut deep ruts,

and one of less diameter still deeper ruts." It is also found that "a tire four and one-half inches wide caused no more damage than one seven inches wide, and that above four and one-half inches there is no special advantage or saving in wear on a road."

It appears, therefore, of questionable expediency in the present condition of our public roads to undertake by general legislation to control the width of tires or the diameter of wheels, as experience in all countries shows that such laws are rarely enforced. There are probably not less than one hundred thousand wagons now in use in our province that would need to undergo alteration, at a cost of about $20 each, or a total of near $2,000,000, an amount sufficient to build about five hundred miles of Telford macadam road at $4,000 per mile, which would not be likely to suffer from any width of tires used upon them, or one thousand miles of good macadam at $2,000 per mile, or four thousand miles of gravel road at $500 per mile—enough to fairly improve all leading roads of inter-town and village connection throughout our whole province. In proportion as our roadways improve and good roads take the place of bad, the tire question will doubtless become unimportant.

The metal or stone part of ordinary country roads need not exceed twelve to fifteen feet in width. The shoulder of the roadway on either side should have an additional width of from three to four feet. Twenty-one feet is sufficient to permit two teams to pass, while at the same point a team is standing on the side of the roadway, and thirty feet is quite enough in the business portion of a village to allow two teams to pass each other with vehicles standing near sidewalk on either side.

It will not be necessary for me to give any detailed description of the proper method of constructing a good macadam, Telford, gravel or burned clay road, as the Ontario Department of Agriculture has recently issued a very timely and valuable bulletin on "The Making of Roads," relating particularly to methods of construction, which can be had free on application. I will quote a brief but important paragraph from this bulletin:

"The metaled part of a gravel road should not be less than 8 feet wide. In some parts of the province it is very difficult to get either stone or gravel. In such cases a good substitute for the bottom course can be made of well burned clay, placed on the road in a similar manner. It will not answer so well for the top course, which should be of a hard, well-wearing material, either broken stone or gravel. But a road wholly constructed of hard burned clay on a properly-prepared foundation is undoubtedly superior to a mud road and can be built at a reasonable expense."

Notwithstanding the numerous horse and cable car lines, electric and steam rapid transit ways of cities, it has been found of paramount importance also to equally extend their paved wagon and carriageways. Careful consideration will show us that it is of equal public necessity to improve our common country roads as an indispensable auxiliary to the development and extension of railways. To properly understand the importance to us as a commonwealth of this question, let us compare the present state of our roads in general with those of any other civilized country in the world, and will we not find our country deplorably down at about the bottom of the list as far as having made any substantial progress, or as yet adapted any extended scientific system of road building? If we but compare our water-bound provincial peninsular garden with the bordering states of New York, Pennsylvania, Ohio, Indiana and Michigan, surrrounding us in the east, south and west, we find they have long since adopted the more modern system of road management, while we are still clinging to the ancient and original Indian path-master system, so ineffectual and so unsuited to our changed conditions, and advancing civilization.

Is not the question of good roads, therefore, especially to the agriculturists of our province, second to none of public import? We may congratulate ourselves, and feel justly proud of our pre-eminent position, as shown at the World's Columbian Exhibition, regarding our manufactures' stock, dairy achievements, grain, fruit, minerals and other products in which we have attained a leading position among the nations. And yet, have we not been making a one-sided and apparently abnormal progress, in some things, to the great neglect and drawback of other equally if not more important requisites to our well-being as a province and country? I refer more particularly to the apparent almost entire lack of interest that has been shown by those controlling public affairs in the improvements of

our common country roads, while, on the other hand, such enthusiastic attention has been given, by the many influential minds, to railway building, to have caused the Dominion and Provincial Governments, with cities, towns and rural municipalities, to bestow almost unbounded munificence upon the railways of our country. Thus we have experienced an important era of railway construction, brought about by the combined commercial and political influences, until our vast domains have now been spanned and linked together in an unequaled chain of provinces, with a net work of many thousands of miles of railways, from Halifax to Vancouver. The vastness of our territory—whose boundaries are mighty oceans, whose base is at the pole—has doubtless been somewhat the cause or excuse for burdening our fair country with the lavish expenditure of millions upon millions on railways, besides giving away to railway corporations immense portions of our public domain. And yet we are not blind to the immeasurable blessings and advantages we as a nation are deriving from the railways of our land. They have reduced great distances as it were, and have brought the most remote portions of our country within a few days or hours of each other. They have been a most important factor in developing, fostering and binding us together in a truly united national sentiment, and although we may criticise the questionable methods of expenditure connected therewith, we are all proud of our pre-eminent position in possessing the longest and best equipped railway under one management on the globe, as well as the many other lines of equal importance according to their extent. While it is admitted that these great thoroughfares and arteries of commerce are indispensable to our welfare and progress, are not the far more numerous veins or roadways for the comfort and needs of local and domestic intercourse that feed these main arteries, and upon which these great trunk lines are dependent for their very existence and healthful sustenance, of equal or even more importance? The great question then for us to consider is, are we not, therefore, justified in at least making, not lavish, but judicious and proper expenditure, upon our roads? How can we best turn a similar enthusiastic attention of our governments and the influential men of our cities towns and rural districts, to the question of good roads, and concentrate and hold public attention until we have achieved an equal pre-eminence for good roads throughout every well settled country district?

Let us pursue this question, and will we not find that there is every argument in favor of good roads, and not one against? What so binds together the manifold interests of neighborhoods as a good wagon road? While, on the other hand, a bad road tends to keep near neighbors distant, and is a depressing burden on all their movements. Will not good roads put the rural population more on an equality with those of the cities and towns, with their paved streets and many other social and financial advantages, by which quick and perfect local and distant inter-communication is at all times available, and which makes life more worth the living?

Can we not in a large measure find in the (at present) most imperfect and deplorable state of our roadways in general, the explanation for the phenomenal movement of country folk to town, and the objection of the unemployed in the cities to repair to the country to enjoy the wholesome benefits of out-door employment and contact with nature.

Bad roads hinder the more even distribution of wealth by preventing the wealthy in the cities from having their country seats, as in England, where good roads are the rule, while here they are the exception. Would not good roads thus enable the rich to contribute towards aiding the agricultural interests and experiments, and also bring about a better equilibrium between the social status of country and town? The lack of social advantages and means of agreeable and ready communication between the rural households, at all times and seasons, by too often disagreeable and all but impassable state of the roads, is, it would appear, in every district and division of our country, at present, to be the one great drawback and bane of country life. And yet it is quite evident with good roads, and well conditioned in other regards, the rural population are better situated and placed in many respects than the urban people who are massed together in great towns.

Bad roads greatly interfere with attendance at schools, churches, township meetings, farmers' institutes and other modes of associate action that serve to promote the interests of the husbandman and keep him in touch with the more improved methods of farming

and latest discoveries in scientific agriculture. They prevent the farmer, during the rainy seasons, from taking advantage of any shade of rise in market price in disposing of his products. With good roads a farmer may go a much greater distance, 20 or 30 miles, to market and return same day with more comfort and ease and less worry of team than 5 miles over bad roads. If he lives 5 or 10 miles from a railway town, especially in the heavy clay soil districts, and has to team his produce over a bad mud road, by the extra tax thus imposed he may, in a commercial sense, be farther away from that town than he would be if he lived on a line of railway in Manitoba or the North-west territories. One of the effects of cheap railway carriage is to bring the products of distant regions into competition in all our great markets.

Among the several influences causing the depression in agriculture in the older sections of our province and country is the tax imposed upon the farmer by bad roads, which places him at a far greater disadvantage than need be, with the more distant producer having cheap prairie lands and newer and richer soil.

Happily, of all the burdens which the Ontario farmer now bears, this one of bad roads can, by proper action, be readily overcome, and in due time completely removed. Our province has expended in the past 21 years $5,813,667.69 in aiding railways, and including payments of 1893-4 will exceed a round $6,000,000 in subsidies to railways. Fortunately these annual payments are rapidly diminishing in amount, and as no further large expenditure in aid of railways is likely to be made, our province, having done ample justice to railways, will, ere long, be likely entirely relieved of this burden. Our cities and municipalities have also expended proportionately large amounts in aiding railways. Had a similar premium been given in aid of thoroughly macadamizing all our main roads in every county, would not the agricultural interests be now far more advanced, and farming lands greatly enhanced in value from what they are to-day?

Not combination, but co-operation, should be our watchword. How can farmers properly co-operate midst the wastefulness of poor roads? Probably not much short of $1,000,000 annually is the extra haulage tax imposed by bad roads on our chief co-operative dairy industry, which furnishes so large a portion ($14,000,000 worth) of our exports, and which has doubtless been the main factor in preventing us from experiencing a like financial disaster with other countries during the late panic—the worst the world has witnessed in fifty years!

If we but stop to figure the extravagance of poor roads, in loss of time, extra horses, vehicles, harness, wear, tear and swear, in moving the waggon freightage of our province as compared with good roads, we will find it amounts to many millions of dollars annually. Then, too, how many of the mercantile failures may be directly traced to bad roads, putting an embargo on trade that leaves the merchant's goods on his shelves, with maturing bills that cannot be met. The residents of town and country are alike interested in having good roads. European students show us that.

An idea of the enormous loss suffered by the wastefulness of bad roads may be conveyed by comparing the great variation in the quality of roadways in different countries, and the consequently increased number of horses required in the more poorly highwayed countries. Switzerland, which is said to be the best highwayed country in the world, has one horse for every twenty-nine and six-tenths people. In Great Britain one horse, on an average, serves twenty-four people; in Scotland the proportion is one to each twenty and six-tenths; in France the same is one to thirteen and four-tenths; in Massachusetts the proportion is one to twelve and three-fourths, and in Ontario we have one horse for every three and seven hundredths nearly of people. If we reckon the cost of each horse in care and food and wear and tear depreciation at only $50 per month, and estimating that the ill condition of Ontario roads not only doubles but more than quadruples the number of horses employed, we find the extra tax which our imperfect roadways imposes on the people of the province is indeed very large.

Is it not quite reasonable to infer that the variation in the number of horses is largely due to the needs created by the difference in the condition of our roads? It therefore appears, as compared with Great Britain, we are bearing a loss of about $10,000,000 annually. If we calculate the loss of a million persons using the roads in our province at only $10 each per year, we have that amount, though teams kept idle, loss of time on

road and extra breakage, wear and tear of vehicles, harness and horses, not to speak of loss in prices for produce that cannot be taken to market when prices are highest, we find the above not so far out of the way as it at first may appear, as the effect of bad roads compared with good roads. But if we figure one-half, or a fourth of that sum, as the annual loss, it will still be plainly seen we are suffering an enormous loss through bad roads. Is it not to our discredit that we have so long neglected to properly improve and care for our highways, which are of such great public necessity for daily use?

The roads should be such that bad weather would not interfere with a farmer going to town, any more than it does on a railway. Our governments have been expending large sums without stint on experimental farms, and employing numerous experts to hold public meetings in all parts of our commonwealth, and to figure out for us the great loss and waste of poor methods of farming, poor stock, poor shelter and care for same, etc., and we all know the beneficial effects that their systematized reports and organized efforts and eloquence have produced in causing marked improvements and results. Would it not be equally commendable without delay to employ or appoint a committee of road experts or commissioners, who may be consulted at all reasonable times without cost, to hold public meetings in every county, to take evidence and compile statistics regarding the most practical and best methods of road construction and most suitable materials, etc., obtain photographs in many places, showing the condition of the various roads at all seasons, supervise the building of roads and make such other investigations relating to road improvement as may be deemed expedient, and report thereon. Such report would doubtless bring to public attention the great need of good roads more effectually than any other course. I would suggest that this be the first step taken so as to bring about a proper system and organized action toward working out this great problem. Having examined to some extent the road laws of a number of the leading states and countries, I find in all much valuable information and many suggestions by which we may be benefited by the long years of practical experience in road construction in other countries. I have personally witnessed the satisfactory working of a local option frontage tax road law in the State of Indiana, by which any road may be improved if a certain number or majority so wills it who own the land within two miles on each side of the road. The funds required are raised by special tax of one dollar an acre, more or less, as needed, on land fronting on either side of the road to be improved and within one-half mile, the next half mile seventy-five cents per acre, next half mile fifty cents per acre, next half mile twenty-five cents per acre. Bonds are issued and a term of eight years or more given to pay the assessment. Many roads have been improved and general turnpikes built in that state under this system, costing about $1,500 to $2,000 per mile. The British Government, I understand, have a similar frontage tax system in operation in India. Would it not be the part of wisdom for our Legislature to pass some similar workable local option law? But probably a far more comprehensive and in the end effective method for earlier general results will be found if a plan more like that of that foremost of states (Massachusetts), were adopted. Her three able highway commissioners state that, "It seems out of the question to expect by the progress of public opinion to induce the towns of the commonwealth to effect any great change in their road conditions through a material increase in taxes. Any such change, if it is to be brought about, must be attained by general enactments, or, in other words, by some method of state aid in which the richer parts of the commonwealth will contribute to the needs of the poorer."

It is proposed that the State of Massachusetts expend $500,000 per annum in road construction; that the counties first bear all cost of grading the leading roads selected, and also build the bridges; that the state be at the expense of the stone, Telford or macadamizing work, under the supervision of the state and county commissioners. And it is estimated that the 1,500 miles of main highways in that state, by way of inter-town routes, can be put in first-class condition within fifteen to twenty years by this plan. Other leading states are taking a similar plan for road improvement, and I believe no country in the world has ever been able to bring about any substantial road improvement without a fair measure of state aid. Our province has already expended $2,506,000 previous to 1892 in northern Ontario in colonization roads, and is continuing to expend

$100,000, more or less, annually in that larger portion of our province, where they usually have six months solid winter roads, while southern Ontario, with its frequent open winters, has far more need for good roads. I have driven over many miles of these roads in portions of Nipissing, Algoma and Manitoulin Island, and have found these roads connecting widely scattered settlements often in better condition in those extensive and sparsely settled districts than in large portions of the thickly settled older parts of Ontario. By what system of equity is this one-sided expenditure justified? True the funds are obtained from the timber limits of these northern regions, and it is but right that a portion should be expended there. But do not those timber limit funds belong to the whole people of our commonwealth, and should not any system of road expenditure be equitably distributed over the whole province? Therefore, would not our province be justified in moderately increasing its present road expenditure of $100,000 to at least double that amount, and probably to half a million dollars, per annum, and properly aid in improving the leading roads in every county? Some method by way of inducing the local municipal authorities to take action may prove a wise one, the province giving dollar for dollar raised locally, to a limited amount.

A plan similar to that proposed in New York state may be advisable. That is, to first build two leading roads at right angles across each county, and to intersect similar roads in the adjoining counties—these roads to be varied so as to lead to the main villages and market towns. Such roads would be ever present object lessons for building the other roads. I know there are serious objections to state aid for highways or railways, but if it can be honestly applied in Northern Ontario why not also in the southern portions, where it will benefit vastly larger numbers of people?

There are several other important phases of the road question I have not been able to touch upon, as my paper is now much longer than I at first anticipated. I might say in conclusion that where all leading roads are properly improved most of the heavy travel will naturally be taken off the remaining earth roads, causing less rutting on the latter during bad weather.

With the present statute labor tax commuted, which is now optional, and the funds applied in properly grading all necessary earth roads, with one or more road machines in every township, two men and two teams will thus do far more and better work than many times the number of teams and men under the old system, as the richer the man the less days roadwork he generally has to do under our present system; a more equitable plan would be to have a just road rate of tax as now in operation in the state of Pennsylvania.

The travelled portions of a road should not be less than twenty nor more than thirty feet wide, and when all wire fencing is used the fences may be put out six feet on either side to afford less room for the harboring of noxious weeds, in accordance with the present provincial statute, which is subject to township by-laws. I do not expect radical but gradual changes to better methods.

I have presented these views by way of suggestion to stimulate thought, and arouse, if possible, to a more general discussion of this important subject, believing that a plan most practical and suitable to the needs and requirements of our province may the sooner be worked out, and the earlier bring us the inestimable boon of good roads through our province.

Moved by J. N. Chambers, seconded by Thomas Kells, and resolved, "That in the opinion of this meeting it would be in the general interest for the Ontario Government to grant to the municipalities a reasonable sum to be expended on the improvement of the roads and bridges of said municipalities."

Moved in amendment and seconded, that this motion be laid on the table until after the discussion on Mr. Beam's paper. Carried.

Mr. Kells: I consider this is a very important matter, as municipalities all through the province are under heavy taxation just now in order to keep up the roads and bridges. Iron bridges have got to take the place of wooden ones, and those are very expensive.

Now if the Government would make a grant for this purpose it would be a great relief to the farmers of this country. The Provincial Government is only the head of these municipal institutions, and they have means of getting money that we have not, in the way of selling timber, etc., and I think we should get a share of it.

OUR ONTARIO ROADS.

Mr. PATTULLO, of Woodstock, was then invited to address the meeting, which he did as follows: While I thoroughly appreciate your courtesy in mentioning my name in connection with this question, one in which I have taken more than a personal interest, I did not propose to make an address to you this morning or to discuss the exceedingly interesting question which you have before you, because I know some of you are anxious to get away, and in a few minutes I have to leave to keep an engagement at the train.

Allow me to say that I have listened with intense interest to the really able address that you have heard, showing a great deal of research and practical knowledge, and with a great deal of it I heartily agree. With some of the suggestions, however, I do not agree, and probably there will be a difference of opinion in this audience in reference to them; but these differences of opinion at this stage need not lead to any special controversy I fancy. It has been kindly said of myself that I have taken a somewhat active part in connection with this question, but just allow me to say that those who have been trying to force this question upon the attention of the public as one of the live issues of the day in recent years are not the original road reformers at all. There have been road reformers in every part of this country for a great many years past. Many of you are among the men to whom I refer, and you have done good work in your own way. You have studied the question in various parts of the country, and what is more than that, you have applied in a practical way your study of the question to making good roads. But while we fully appreciate the progress that has been made in the past, we believe that that progress has not been commensurate with the progress of the country in other matters; and we feel that while the system under which we make our highways at the present day was good enough for the early history of the country, it has rather outlived its usefulness. You have made great changes in the methods of producing all the products of your farms; in harvesting grain, manufacturing cheese, and a great variety of articles in farming; in building railways, means of locomotion, and so on, but I think we have been so busy in this country in reference to these other matters that we have rather forgotten to make the progress that was possible in the matter of good roads. So that a great many people would like to see the activities of the country now turned in that direction, for good roads are quite as important to the country as progress in other ways. Now, speaking before a body of farmers, I just desire to say this: I happen to be a farmer's son myself, and although not actually a farmer, I am dealing in ideas for farmers and am brought very closely in contact with them on a variety of occasions which I need not now explain. I stayed on the farm long enough to do a great deal of farm work, and also upon the roads under the statute labor system, so that I know whereof I speak from personal knowledge as well as from a study of the question in its general aspects, and I say that this is a farmers' question above all things. It peculiarly relates to the farmers, and good roads will peculiarly promote the farmers' interest; but the farmers are not the only people interested in good roads, because in the towns and villages of this country they have no better streets than you have rural highways. The people of the towns cannot throw stones at the farmers for not making good roads or the system under which they are made, and for that reason we feel that in this question of road making it is desirable to bring the interests of all classes, the interests of the farmers, of commercial men, of manufacturers, of the railways and all the industries of the country—to bring all these interests together to advise what will be the best scheme to adopt in future in reference to the subject. We do not desire any very sudden change in this matter. I myself believe that under the present system we can do vastly better work than is being done throughout the country at the present time; but what we desire is gradual improvement—no sudden revolution either in method or system. I want to

emphasize that, because I know there is a prejudice, and a very proper prejudice, against sudden changes and sudden increase of expenditures. And when the road reformers say to you that the system is bad and the results insufficient, it is a very proper thing for you to say, "What system are you going to put in its place?" And until there is a better system and a probability of better methods, I do not think you should be too anxious, as I have said, to make a sudden revolution in reference to the subject. There was a resolution passed, I heard, at this convention on this subject already, and I have no doubt it was perfectly proper; but it leads me to make this remark, it seems to me that the basis of the legislation at the present time is this eternal tinkering at it, and that eternal tinkering relates to municipal legislation. I am one of those who think that if we have not got too many we have at least a sufficient number of legislators in this country, and a good deal more legislation than is absolutely necessary. I make this remark for this reason, that I should be very sorry to see this body or any other public body at the present stage of the question commit itself in a dogmatic way to any particular method with reference to carrying out the reform. I would rather see the question thoroughly ventilated at your institutes throughout the country, at your Central Institute and through other bodies all over the province; and after the question has been threshed out, your delegates and delegates from other bodies interested in the subject in every part of the country should come together and express by way of resolution the matured judgment of the country on this all-important question of good roads. Then the legislators of the country would have something to go upon, and the legislation in the future, which in your wisdom and the wisdom of the country may be necessary to secure good roads will then represent the intelligent and progressive judgment of the whole people. I am glad to be able to make these remarks before you, because, as I have said, this is a farmers' question, and I want to say here that in the end, when this question is threshed out, it is the votes and influence of the farmers of this country that will settle the question of road reform, as they will settle a great many other questions. In considering this question I have kept in my mind constantly this thing above all others, that this is not only a matter affecting your interest particularly, but it is one with which you have to deal, and for the solution of which we look to you in the end.

I have said more than I intended to say when I got up, but I want to make this intimation: Believing as we do that sufficient attention has not been paid to this matter in the past—that it has rather been neglected to the advantage and interest of other questions—we believe that the time has arrived when we should cease mere declamation, mere shouting about bad roads, and go to work and do something. You know that the present is an age of organization, and very few causes can be promoted without organization, and for that reason we are endeavoring at the present time to secure, if that is considered advisable, an organization which shall have for its sole object the promotion of the question of good roads. There is a meeting here to-morrow for that purpose, and I may say that that meeting was called to-morrow especially because you, the members of the Central Farmers' Institute, were to be in the city this week, and the members of the Canadian Institute, who have kindly taken the matter up and gone to the trouble of calling the meeting, desire that every member of this Central Farmers' Institute shall consider himself a delegate to that meeting to-morrow, and that you will bring your friends and every one interested in the question.

Mr. HANLEY: On the first day of the convention I moved a resolution requesting the Ontario Legislature to pass an Act tending towards the total abolition of statute labor, and it was referred by the committee to be discussed in connection with this paper. In regard to that, I think the first objection that might be made to it is this, that it is already permissive on municipalities to abolish statute labor if they choose. But I think if you give the matter serious consideration you will agree with me that the whole system has outlived its usefulness, and although it is a very good system for a new municipality, in old communities it is no longer an advantage. In the first place it is very seldom performed in a satisfactory manner; in some municipalities there is very little performed at all. I therefore feel it should be taken out of the hands of the municipality entirely. I don't feel disposed to recommend any expensive substitute; I think the municipalities can provide some substitute themselves. I think if they had a tax of only 20 or 25 cents per

head it would be much better than all the statute labor done. It may be said that we can easily regulate it, but I find that most councils would rather not have anything to do with it. I thought I had made a very satisfactory arrangement when I introduced a by-law and operated it successfully for a year or two, giving the road superintendent authority to see that in every case statute labor was done, but it was objectionable for two reasons that pathmasters would take in boys not over ten years of age and old men past their usefulness and return them as having done a day's work. As soon as I retired from the council my successor was not willing to take that trouble, and now the matter is back to its original state. So I think the time has come when such a thing as the old statute labor should be abolished altogether.

The PRESIDENT: This matter has been threshed out two or three times in this Institute already. We have the necessary legislation now, so that every municipality has it within its power to abolish the statute labor system if it sees fit. I think it would be wise under the circumstances to withdraw the motion.

Mr. CLARKSON: I think this proposition is not altogether on the lines of existing law. This is a proposition to take it out of the hands of municipalities by Act of the Legislature. I live in a section of the country where we have very flat land, and we have to depend very largely on surface drainage to get rid of the surface water, and we find that the cheapest and easiest available means for the conveyance of that water to properly constructed outlets is through the medium of the ditches along the roadside, and those ditches have been in the past, and I hope will continue in future to be, constructed very largely under the system of statute labor. The course we have pursued is, whenever an individual is interested in the improvement of a certain portion of the road ditch for the drainage of his land he is directed to perform his statute labor, and while he is improving the drainage of the road he is also improving the drainage of his farm. By this means we keep the farmers directly interested in the performance of statute labar effectually, so that it is to every person's interest to give good value for the time he is recorded. I think for this reason it would be a very great mistake, as far as that section of the country is concerned, to do away with the present system of statute labor.

Mr. FLEMING: I live in a portion of the province where statute labor is not altogether so bad as people suppose it to be. We use it to good advantage in this way: oftentimes when people want work done along the roads they are willing to commute their statute labor for a number of years, and in doing so they will do a great deal more labor than you could otherwise get out of them. Not only that, but the people have the benefit of the road long before they would otherwise have it. For this reason I think that no arbitrary rule should be made in regard to it.

Mr. MONTEITH (South Perth): This is a question which I regret very much we should be compelled to hurry through. It is a question which is more interesting to the average of our farmers than almost any other question we have discussed at this meeting, and I believe it would be in the interests of this convention to adjourn the meeting and discuss it in the afternoon on broader lines than we have yet discussed it. We should discuss it as to what is the best grade and what is the best amount of gravel to put on that grade and all the other questions connected with it. These are questions that every one should go home intelligent upon, because these are things that are of practical value to us and will add to the value of our properties. As to the resolution of Mr. Kells, I would object to that. In ambitious townships, where they believe in permanent improvements and have gone in and paid heavy taxes for erecting iron and steel bridges and solid, substantial improvements, it is not fair to them to have to again pay for improvements in more lax townships. In my own township, Downie, we have expended in the neighborhood of $15,000 upon iron and steel bridges with stone abutments, and $3,000 in stone culverts and vitrified tile; and we are in hopes that in a few years, by such means, our taxes will be greatly reduced. Now, should this resolution carry, it would place us in an unfair position, and for that reason I object to its passing, for it is really giving a bonus to those who have not had the ambition to improve.

Moved by Mr. MAHON, seconded by Mr. GORDON, "That as the resolution is very pertinent to the matter under consideration it be laid on the table during this discussion, to be taken up afterwards and disposed of." Carried.

Moved and seconded that we adjourn till two o'clock for further discussion.

Moved in amendment that we continue in session upon this road question until settled and adjourn *sine die*.

Amendment carried.

Mr. McBride: In the County of Bruce some 26 years ago we voted some $250,000 to build roads, and in two years we had some 260 odd miles. It was a comparatively new country at that time, but we have paid that debt off. We gave $250,000 to the Toronto, Grey & Bruce Railway, and almost every municipality voted money to the Port Dover road, so that we have spent a lot of money to get communication with the front. You can hardly travel in any direction without striking two or three gravel roads, but I thought we were behind in the matter of roads till I came out here. About putting boys and old men on the road to do statute labor, I think it is a shame. I am glad I don't live there, because men that will stick in the mud in that kind of way will never amount to much. I hope you won't go to the government asking for this, for we are continually blaming them for spending too much money as it is.

Mr. Kells: You seem to think that because you have your roads made and are proud of them that it is all right, notwithstanding that there is hardship in the northern parts of the province with regard to this matter. As regards the impropriety of asking the government to grant a sum of money, it is our money and we have a right to it.

Mr. Fight: It is easy to find fault, but the question is how to remedy these things, and I think it is impossible in Canada to have roads like we have heard of in that paper, the roads they have in France, Belgium and Switzerland. In the first place, in those old countries they have leading roads from one city to another built by the government, but our farm roads to-day are better than the farm roads there. For these leading roads there is an inspector, and the road is made on scientific principles, and there is an old man every two or three miles living in a little house on the road, and he looks after his part of it, getting perhaps 15 or 20 cents a day. But for us to make roads like that would take millions of dollars. Then here we have mud in the spring and frost in the winter. I have seen gravel roads that we thought were good in the fall, but before the spring is over the mud is on top of the gravel. In the old country they put in from four to five feet of stone and then they have iron rollers and they keep on that way till they get the road perfectly level, and instead of scraping mud on top of it they scrape it off and put it on the land.

Moved by W. Fisher, seconded by A. H. Pettit, "That this Central Institute here assembled express its hearty thanks to Mr. Beam for his instructive and interesting paper on road improvement." Carried.

Mr. Beam: I was deeply interested in the remarks about the roads of the old country, but my paper was more to throw light upon the subject of road improvement. I have not fixed on any plan to adopt, just suggested to look to other countries to get all the information we possibly can. It is to the leading roads only that I propose that we give special attention, that we should have commissioners that should take charge of these special roads.

Moved by P. Mahon, seconded by G. Hood, "That while it may be desirable to commute the statute labor generally, it may not be well to force the matter upon the municipalities by legislative enactment, but would recommend that the municipalities take the matter into their most serious consideration."

Mr. J. H. Woolley: I advocate leaving the power in the municipalities. As we have it now, the statute labor is entirely in the hands of the local authorities, and I admit that there is a good deal of time thrown away in different parts of the country in statute labor, but who is to blame for that? When I am pathmaster I handle that road just the same as if it belonged to me, and if a boy comes that is not able to do a day's work I tell him so, and if the man has got property he must send a fit substitute, or else I shall return it to the council to be added to his taxes. Now,

there are clay roads, and there may be no material within reach to improve these roads; but we have an American road machine, the greatest improvement for clay roads that I know of; as Mr. Beam's paper said, in the first place drain the road, keep it dry; that is the intention of all roads no matter what the material is. Look at these road machines what they can do; four horses and two men can do three miles in a day and put it in order. It smoothes it and grades it and it gets dry very quickly. Where they have gravel pits they allow so many loads for a day's work, and they draw that gravel in winter. Men up there have statute labor done two or three years ahead by doing it in that way. Sometimes when I am very busy at my turnip ground and the road work comes on, I would not allow my team to go on there for two or three dollars a day, and I pay my money in and the pathmaster has got to take it, and it is a just law. I think the present system gives general satisfaction, and I believe that the majority of this meeting will leave it right where it is.

Mr. PARKER: There was a by-law submitted in North Zorra two years ago for the purpose of doing away with statute labor, and the by-law was defeated by something over 300. We have talked that matter over at the Institute more than once, and we have come to the emphatic conclusion under the present circumstances that the statute labor is the best system at the present time. A few people will find fault because certain parties do not perform their work, but are you going to condemn the principle because a certain person violates the law? If a certain person does not perform his work all the pathmaster has to do is to return it undone, and then he will have to pay it in taxes, and when he pays the taxes we have in our municipality for a few years he will think he had better perform his duty. I think we had better continue as we are.

Mr. ZAVITZ: We don't require the roads that they do in Europe. They were built long before railroads were built; and we are all aware that the railroads have relieved us very much of the teaming that was done before, so we do not require such roads at the present time. I live in the Township of Lobo in the County of Middlesex, and I have travelled through several of the States, and know something of the roads they have there, and I believe we have better roads in Middlesex than in any of the States I have travelled in yet, and we have done it by statute labor. Our township has done some good work in addition to the statute labor by giving $1 a day to teamsters for doing extra work, and a great deal of work has been done in that way, and I am satisfied that it has been done cheaper than it could be done in any other way. They give $1 a day for teamsters hauling gravel on the roads with a team, summer or winter, and they give $1 a day for a shoveller.

A MEMBER: Do I understand that is a job of work for any day for a teamster?

Mr. ZAVITZ: No; the pathmaster has power to make "bees" in his beat, but he has to receive the permission of the commissioner before such a "bee" can be made. Now, I think these electric roads are going to relieve us still more from the tedium of teaming our grain 20 or 25 miles, and I think the present system is plenty good enough for this province.

Mr. WHITE: I refused to work on a concession this year, because my pathmaster would not allow me to work on the sideroad, and my work was returned undone. I went to a contractor who was taking a job on the sideroad, and asked him what he would take to put on as many yards as I would have had to do I had to pay $7 in cash for the statute labor I should have done, but he would have put the same amount of gravel on for $2.80. Now, I believe we can get better roads for half the money if we paid for doing the work by contract.

Mr. PAGE: Those divisions which have been doing faithful work in the past in building up the roads to a good standard would be unfairly dealt with under the change. I am sure in many instances there are three loads of gravel taken out on the road to make an ordinary yard. In our division we have done ordinary work and we have good roads in consequence. I think it would be better if, instead of changing the mode, we regulate the enforcement of full and faithful work.

Mr. CLINTON: I offer this suggestion: Would it be wise if our township would set aside a certain amount to be spent on the roads, and employ a commissioner for a certain number of months to see that this work is done, and have it done by contract or by day labor, as he sees fit. Now, I live in North Essex and it is very flat, and I may say

that some of our men walked six and seven miles to our meeting at Comber rather than drive. If a man stands in with the pathmaster he will turn out and do his work any time it suits him, but he might do it at some season when his work would do twice as much good as when he does it. It seems to me it would be wise to do something of this kind: to appoint a commissioner who is under the supervision of the township council, and who is paid to look after that and do it right.

Mr. Woolley: In our part, the South Riding of Norfolk, we have just got out from one taxation of 21 years, and we are under the other yet, and we are doing good work under the present law. This proposal to abolish it reminds me of a man that comes up to me and says "your coat is not as good as it ought to be, take it off and throw it away" without telling me where I will get a better one.

Mr. Pringle: My own opinion is that we better leave the law as it is, and carry it out as it is. If the pathmasters don't do their duty the remedy is with the people who appoint them. I am struck very favorably with that mode adopted by the council of Lobo, of paying $1 a day for work outside the road work. I noticed that the members received that with incredulity, but you must remember that in these hard times there are men in every municipality that are glad to accept $1 a day and do a good day's work. I think it is a good thing in two or three ways; and it will give work to men who honestly need it, and that are willing to do a good day's work. That is the best suggestion I see of them all, and I would recommend municipalities to follow that example.

Mr. McDougall: There is no need of discussing statute labor here, for every municipality has power to deal with it. But I was going to tell you what did a great deal for roads in the township in which I live—Ekfrid. We have invariably made it a rule that where the residents along any particular road desire to permanently improve the roads, if they get their hands in their pockets and pay half of it the council will pay the other half, and that has done more for the roads than any other scheme we could devise, and to-day, although it costs us $3 or $4 per lot to gravel our roads I venture to say there is no township in Ontario that has more gravel roads than we have.

Mr. Drury: I may speak with 30 years' experience as reeve of our township, and I was a party to placing upon the statute book the law which makes it permissive to allow any municipality by by-law to abolish the system of statute labor and substitute the system of commutation. Now you are proposing to ask the Government to abolish statute labor by Act of Parliament. I think it is very important that a body like this should consider very carefully any recommendations they make to the Government if they are to have weight. With regard to the schools, the law was at one time that if you got a majority of the ratepayers of a school section in favor of it you could have a free school, but if it were not adopted by a majority it was a rate school. That was the law until about one half the schools in the province had voluntarily adopted free schools, and then the Government stepped in, on the recommendation of Dr. Ryerson, and made all the schools free by law. Now, only a few years has elapsed since the law was changed, under which municipalities possess the power to abolish statute labor. If a return were asked for at the coming session of the House as to how many municipalities availed themselves of that provision I think you would find that there are not twenty municipalities in the province that have taken advantage of it, and now you are asking the Government to abolish by compulsory act a thing which you are not able to abolish by the voluntary action of your own people. I think you would be laughed at in view of this fact, and therefore I hope the proposition will be voted down. While I stand as an advocate of the abolition of statute labor, yet I have been in advance of my own people, for I have not got them to consent to it in my own township. It would be folly to pass such a resolution, for, in this country, the people rule.

Mr. Hanley: I desire to withdraw the resolutions.

The President: If the original is withdrawn, Mr. Mahon's amendment will become the original.

The motion of Mr. Mahon was then put and carried.

Mr. CHAMBERS: As the mover of the resolution asking a grant from the Government for the building of roads and bridges, with the consent of the meeting I desire to withdraw it.

The resolution was consequently withdrawn.

The resolution of R. A. Jamieson, seconded by William Gibbons, "That in the opinion of the Central Farmers' Institute one-half of the statute labor should be performed in the winter months," was then voted upon and lost.

Mr. GORWILL: There is another motion in regard to roads. It was moved by myself "That the Ontario Government be memorialized, asking them to amend the Municipal Act so as to define what shall constitute a lawful road, and also to require no municipality to make the travelled portion of a road more than 24 feet in width." My reason for moving that is the indefiniteness of the Municipal Act at the present time. The East Riding of the County of Middlesex, where I live, has suffered severely on account of accidents happening on the highways within the last two or three years, and no doubt other ridings have suffered in the same way. Mr. Justice MacMahon ruled in the City of London at the hearing of one of these cases a little over a year ago that as the Municipal Act reads at the present time every municipality is required to keep the whole road from one fence to the other in a fit condition for the public to travel on. Now I ask you if that is not ridiculous? There is not a municipality in the province of Ontario that is able to keep their roads in such a condition. Whether Justice MacMahon is right or not I am not prepared to say, but anyway the law as it reads at present is so indefinite that judges may differ. At all events that is Justice MacMahon's ruling and heavy damages have been secured by the parties from the municipality in consequence. Mr. Gorwill's motion was then carried.

Moved by ALEXANDER RITCHIE, seconded by ALFRED HUNTER, "That the Executive Committee be authorized to get the Rules and Regulations of this Institute printed in pamphlet form, and give one copy to each member of this Institute when he receives his ticket of membership. Carried.

Mr. RAYNOR: In reference to the paper of Mr. Bowes, "Farming interests as one of the Divisions of Labor," I move, seconded by Mr. A. H. Pettit, that it be taken as read and printed in the report of the Institute.

Mr. PETTIT: My intention in seconding the motion was that it should be referred to the Executive Committee and let them order whether it shall be printed or not. With this explanation the motion was carried.

VOTE OF THANKS.

Mr. FIGHT: I would like to move a vote of thanks to our Chairman and officers for the prompt way and cordial manner in which they have conducted the business.

Mr. J. H. WOOLLEY: I have much pleasure in seconding the motion. The motion then carried.

Moved by D. STEWART, and seconded "That this Institute thank the press of the country for publishing the bulletins issued by the Bureau of Industries and College and Experimental Stations' reports, whereby many who are not members of the Institute also receive much benefit."

The PRESIDENT: And also to the members of the press who have attended our meeting. The motion was carried.

The meeting then adjourned, and the Convention closed.

APPENDIX.

ELECTORAL DISTRICT FARMERS' INSTITUTES.

SELECTED PAPERS READ AT JANUARY MEETINGS, 1894.

THE SECRET OF SUCCESS ON THE FARM.

By John Campbell, Woodville, Ont.

Because of the comparatively few who win much success in farming, it is thought by the unsuccessful that it is owing largely to some stroke of chance or to some secret ways and means, which lead to prosperity. But as by far the larger part of our labors are open to the inspection of any who care to notice our doings, we must seek the secret elsewhere. Let us first ask, what is success? Some seem to think it is making a display or trying to outshine the neighbors in home and dress, in fancy stock or beautiful carriages, or perhaps living so as to appear well-to-do. Those are the counterfeits. True success is first of all the faithful carrying out of the instructions given by our Creator to our first parents when placed in the ideal garden "to dress and keep it."

Those directions reduced to our time and language would mean something like this: To so live and act that, while we strive to be as comfortable as possible with the present circumstances, our constant aim shall be to better our condition, improve our surroundings, provide for possible misfortunes during active life, and so regulate our affairs as to have them afford us their share of comfort when old age and weakness overtake us. In order to be thus successful, we must have a high aim. In early life all have ideas regarding the future. Often we have some person's career before our minds as an example to copy from. If that life has been of high merit, let us take from it every lesson we can grasp, and surpass it in excellence if we can. If, however, the example is of a low standard, there is great danger of resting satisfied with a similar condition, and failing to have the success within reach.

Without strict honesty we cannot be successful. If our dealings in daily life need constant watching by others, failure in business, failure in life will be the result. Two men are marketing grain. One farmer's produce is not looked into after he delivers his first sample load, as the dealer well knows he will be told of any difference there may be in the deliveries. Every load, yes, every bag sent in by the other is closely watched.

Two neighbors sell cattle for future delivery. One is cheerfully paid for the well-finished animals delivered, and the dealer makes a note of it in a corner of his memory. His neighbor's cattle are found not up to expectations, and the dealer pigeon-holes the fact that he wants no more cattle from this man who is so smart. A feed of meal saved one day, neglect of watering the next day, and laying aside the curry comb made all the difference; and that farmer's name is passed around among dealers. Did such a reputation ever pave the way to success? A guidwife's butter happened to be flavored highly by leeks. On going to market she took a bit of that vegetable along to get the shopkeeper's opinion as to what it was. After he tasted the leek, she sold him the butter at the highest price, for to him it had excellent flavor. By her so called cleverness, she got more for her butter than it was worth; but was it honest and did she gain a customer? A man or woman, boy or girl, whose every word and action can be taken at full face value has one of the very best means of securing permanent success.

Expenditure on the farm is often a critical matter and has much to do with our prosperity. Until luxuries can be afforded, the outlays should be of that kind which will increase the income. One will expend hundreds and thousands in building a grand house, while his stock is suffering from the want of shelter and his fields are but half as productive as they might be with proper drainage. Not for a moment would I advocate the thinking more of stock and fields than of our own comfort, but too often there is less real comfort in the great overgrown new house, perhaps carrying some encumbrance, and with bare surroundings, than in the discarded, old, cosy fireside, which might have done well for a few years longer. Then the new home, flanked by good outbuildings and well-tilled productive fields, but without the liability, would become a factor in the way to further prosperity.

Giving close attention to little things has a wonderful effect in helping our capital to grow. With the mixed farming of our time, there is no other occupation which has so many details. Stopping a little leak here, increasing the profits in another line and the spending of a dollar elsewhere so that it shall come back with a partner in its arms, will make a surprising difference at the year's end in the farm returns.

Keeping farm accounts tends to success as much as anything I know of. Make a memorandum each night of the day's doings and business done in buying or selling. Have separate pages for receipts and expenditure, add them up weekly or monthly, to compare with the cash on hand. Annually take stock of all animals, grains, hay, roots, implements and tools at market values, to find out whether the operations of the twelve months have been profitable or not. By so doing we can often detect past mistakes, and so avoid them.

"Pay as you go," yes, and go as you can pay, are by no means of little importance. Some day when we have more irons in the fire than we can properly attend to an agent drives up, who, after a few plausible remarks, proceeds to talk up the advantages of having one of his machines, and goes on to show that we cannot afford to be without it. An hour or two of valuable time is lost to the farm, but the agent has made a sale of an article at $140 payable two years hence without any interest. The truth is that nearly 20 per cent. per annum is paid by the farmer, as $100 cash would buy the same article.

Again, I go to a shopkeeper, who is very accommodating: I want shoes and tea, but have no money. As Mr. Shopkeeper remembers I am very slow pay, he gives me tea at 35 cents and shoes at $2. My ready cash neighbor goes next day to the same shop and returns home with similar articles bought at 30 cents and $1.60 respectively. Here is a saving of nearly 24 per cent. This is really one of the secrets of success.

Keeping posted in all matters relating to productions and their values brings its certain reward. A smart American who was not very neighborly, and was so economical that he took no newspaper, drove a large lot of hogs to market in December of 1892. Before reaching town a jobber offered him $6 per cwt. for his lot. As that was so much higher than the price received the year previous he jumped at the offer, and lost enough to buy him two or three good papers for the next forty years. Let us find out what is wanted in the available markets at profitable values, consider if the demand will probably be a lasting one, and then put forth our best efforts to supply the very best, and to obtain the top prices. It is the extra price that yields the greatest profits.

Husband, wife and also family, as they grow up, should be considered partners in the firm, each one taking special interest in his or her department, and when necessary, ready to assist each other, thereby developing every line of the business, so that a successful whole shall be the outcome.

In conclusion, let us notice where the word "failure" might be properly written over or across success. After many years of careful, energetic toil has secured a large measure of prosperity, we see occasionally the habit of thrift becoming so fixed, as to prevent the proper enjoyment of the accumulated means. We cannot help pitying those who, having secured a competence, yet plod on in pain and weakness as if life depended on constant exertion.

Does it not gladden our hearts, when we see happy old age spent in peacefulness,—no anxieties for the present and no disturbing thoughts regarding the future. Just a prosperous active career crowned with the true enjoyment of the fruits of past labors, reflecting to us in conversation and life what the secret of a successful life is.

AGRICULTURAL SCIENCE IN RURAL SCHOOLS.

By Professor J. Hoyes Panton, C. A. C., Guelph, Ont.

That there is now a strong desire among farmers to know more about their occupation, especially in reference to the teachings of science regarding it is very evident to any one who attends the Farmers' Institutes in different parts of the province. Already it is quite manifest that many are reading articles in agricultural journals, which discuss the scientific aspect of the operations upon the farm. Science has become popular, and its teachings are daily being sought after. The farmer cannot know too much about the soil, air, plant and animal, with these his life work is closely related,

and from them he must get the results necessary to success. Science reveals much concerning these, and, if properly applied, must make life upon the farm attractive and successful. It is also evident that farmers are desirous of having the principles of science taught in their public schools, and some agitation has been going on in reference to the work; but the want of a proper book, suitable teachers, and sufficient time has retarded progress in that direction. The first obstacle has been overcome to some extent by the Minister of Education authorizing the use of an admirable book on agriculture, written by Professors Mills and Shaw of the Ontario Agricultural College.

How and when to teach the subject of agricultural science are still difficulties to be met. To meet these the writer will make some suggestions which he considers possible and practicable, and if adopted would accomplish the desired results of the most sanguine in advocating the teaching of agricultural science in our rural schools.

Let the last hour of each Friday afternoon be devoted to a talk upon some subject connected with agriculture. The pupils under ten or twelve years of age might be dismissed, unless it was found that some were desirous to remain. In these talks the teacher should, as far as possible, appeal to his pupils through the senses of sight, hearing and touch, and thus cause them to use their eyes, ears and hands. Illustrate by black-board diagram and specimen, and encourage the pupils to collect the specimens in the section where they reside. The writer would recommend a regular order of subjects to be followed.

The fall term could be devoted to talks upon geology as it bears upon the origin, formation and composition of soil. A most interesting and instructive series of talks could be given on this subject without dwelling upon its technicalities. After such the soil would present many attractions to the boys and girls, and the stones by the wayside would become full of interest.

The winter term could be spent in discussing chemistry and agriculture. Many simple but interesting experiments could be performed to illustrate the properties of the elements found in plants and animals and some of the compounds which they form. These would excite interest in the chemical changes constantly going on in the soil and in animal and plant life. Tillage, rotation of crops, fertilizers and stock would afford material of an interesting character for several talks.

The spring term would be very favorable to talk upon botany. Plants should be brought into the school-room, the parts of a flower learned—one flower compared with another. By all means the pupils should learn to know our Canadian wild flowers; the weeds of the district should next receive attention, and finally refer to some of the families of plants of economic value in furnishing us with fruit, cloth, timber, roots, grain and forage. By the aid of diagrams the microscopic plants which cause mildews, blights, smut, rust, etc., could be easily discussed. In summer a study of the insects of the neighborhood could be followed. Teach what an insect is; describe the different orders of insects, and then take up the injurious and beneficial forms for special study. In all the subjects emphasize collecting specimens, and select the best for the school museum. The question which naturally arises is: How can teachers be obtained for the work?

The Hon. John Dryden, Minister of Agriculture, has wisely provided for this, by establishing a summer school at the Ontario Agricultural College during the month of July. Here teachers may attend a course of instruction along the line indicated above without any charge save three dollars a week for board. During the course lectures are delivered in the forenoon of each day, and practical work is followed in the afternoon, either observing in the fields or working in the laboratories. In the lectures special emphasis is laid upon *what* to teach, *how* to teach it, and the *sources* from which information suitable for instruction upon agricultural science in rural schools can be obtained.

The well-equipped chemical and botanical laboratories, the museum and the excellent collections of plants and insects are accessible for practical work. Teachers taking this course should not experience much difficulty in continuing a series of talks throughout the year on some, if not all the subjects referred to in this paper.

Such teachers would certainly be a boon to our rural districts and worthy of something extra for such pre-eminently practical work. They would be well able to use profitably the book on agriculture, now authorized.

If such a course of instruction, as outlined in this brief paper were followed in the rural schools throughout our province, we might reasonably expect in a few years the following results:

1. Many *observers* interested in the book of Nature seeking the why for certain operations upon the farm, and eager to learn something regarding the silent processes of nature.

2. Many *systematic* workers in the field of nature.

3. Many able to read *intelligently* articles treating of scientific principles connected with farm life.

4. A strong *desire* to read something of more practical value than sensational stories.

5. Above all greater *attachment* to the farm, for their study of nature would have enabled them to find "tongues in the trees, books in the running brooks, sermons in stones and something good in everything."

6. Every rural school would have a *museum* containing specimens illustrating the geology (rocks), botany (plants) and entomology (insects), of the district.

7. A noble type of *manhood* developed from a close communion with nature, which would have a tendency to raise from nature up to nature's God. The above is the outline of an address which the writer has given before several Farmers' Institutes. He has not thought it necessary in giving this synopsis to go into the details to be taught in each subject, but simply to map out the work and show how teachers can be fitted for it.

BUTTER MAKING.

By Joseph Yeiles, Carleton Place, Ont.

We are of the opinion that Canadian butter will not take the place in the British market that our cheese does until it is made in creameries and made in winter, and we would strongly recommend fitting up our cheese factories for the manufacture of cheese in summer and butter in winter. If patrons would have their cows coming in in November or December they could have their milk made into cheese in summer and butter in winter. If they have the right breed of cattle, and feed and care for them properly they will milk well all winter and milk pretty well all summer too.

There are only four points essentially necessary for the manufacture of good butter. Two of these belong to the men and two to the women; the two that belong to the men are, first, the right breed of cattle for the purpose intended, and the second is the feeding. The two points that belong to the women are, attention and cleanliness.

First select the breed of cattle best suited for your purpose. This being done, next comes the feed. When I speak of feed I mean water as well as the more solid food.

When cows are milking feed nothing but sweet and wholesome food; do not allow cows to eat at the stable door. I do not mean to say that horse's bedding is bad for young cattle or for cows that are not milking, but it is not fit food for cows that are giving milk.

Allow your cows to get nothing but the purest water, and of that as much as they will drink at least twice a day. The milk from our common Canadian cows when grass fed contains 87 per cent water. The cow has no filter in her to purify water, and if the water is impure the impurity goes straight into the milk. If a cow drinks 100 lb. impure water 87 per cent of the impurities of that water will be found in the milk.

Never allow your cows to drink water that you would not drink yourself.

We will take it for granted that the man has done his part, that is, he has fed and watered his cows properly. Next comes the women's part. First is the milking. Now I

do not wish to be understood as saying that the women should do the milking, but I think the women should see that it is properly done, for I am afraid if it is left to the men, sometimes it will be done in a very slovenly manner.

The milking should be done with clean hands.

The cow's udder should be rubbed off clean with a cloth before commencing to milk ; strain the milk as soon as possible after milking. I consider the separator is the proper way to take the cream out of the milk, but if you have not got a separator strain the milk into cans 20 inches deep and 8 inches in diameter ; add enough water heated to 130 ° to bring it up to 98 ° F. the heat it was when it was taken from the cow. Place it in water sufficiently cold to bring it down to 40 °. In summer the cream will be all to the top in twelve hours, while in winter it will require twenty-four hours.

Skim a with tin cup, put cream into a crock or tin can ; keep it below 55 ° until you have enough cream to churn ; twenty-four hours before you have enough cream to make a churning take half a gallon of cream, heat it to 60 ° keep it in a warm place to ripen, warm all the cream you intend to churn to 60 ° F., then add the half gallon of ripened cream, stir thoroughly, put on the cover until it is ripe enough for churning, which should be in about 24 hours. Churn as soon as the cream is slightly acid. Never allow it to rise above 64 ° F. in winter and 58° in summer.

If your cream has been taken off without any milk in it add some milk without cream so as to float the butter in the churn, but if there is no milk in your cream add one quarter part as much water as you have cream to float the butter in the churn.

Use a churn without any breakers in it. The smoother and plainer the inside of the churn is the better. This holds good with all milk dishes and dairy utensils ; the plainer they are the easier it is to keep them clean. We use a number five "Daisy" churn which churns ten gallons of cream, and all our instructions, such as the amount of cream to ripen, the quantity of water to use, is based on ten gallons of cream. The quantity can be changed to suit the amount of cream churned. Prepare the churn by scalding with hot water, and in the summer rinse with cold water after scalding. Take one yard of best cheese cloth, and run a wide hem across each end and three plaits in each side so as to form a bag ; run a wooden rod through each hem, hang it in the churn and strain the cream through it.

If butter color is to be used this is the stage at which it should be put into the churn. It depends a good deal on the kinds of food that are being fed whether you require to use butter color or not. If cows are fed on well matured ensilage very little butter color will be required ; but if your customers want it colored then color it for them. There is a very close connection between the eye and the appetite, so always try to put your butter on the market in the most pleasing form possible.

We have used Wells Richardson's and Houson's butter color, and found both gave good satisfaction. One teaspoonful is enough for ten gallons of cream.

If your churn requires a higher temperature raise it by putting some cream in a tin dish and set this into a pot of hot water and keep it thoroughly stirred. The danger of this method is that if the cream which was heated has been raised above churning heat the butter from that part of the cream will be soft. If you prefer you may heat all the cream to the required temperature, or you can heat the cream by adding water at 130 °. We use the hot water.

There can be no rule laid down for the temperature at which to churn ; that depends to some extent on the temperature of the room in which you churn, the time of year and the kind of a churn you use. In summer we churn at from 58 ° to 60 °, and in winter at from 62 ° to 64 °.

Churning should be done in from 30 to 35 minutes. When the particles of butter are the size of flax seed put half a pail of cold water into the churn to separate the butter from the buttermilk ; turn the churn round half a dozen times, draw off the buttermilk, allow it to pass through a fine strainer to catch any particles of butter that would otherwise escape. Then put the pin in and put in three pails cold water at from 40 to 45 ° into the churn, then put on the cover and churn for half a minute at the rate of one hundred revolutions per minute so as to break the butter up into small particles, draw off the water and repeat the water process. Then put in two pails of water at 52 ° in winter

and 45 ° in summer with two tea cups full of salt in it, turn the churn a few rounds, draw off the pickle and by this time the butter granules will be as fine as hay seed.

Salt to whatever degree your customers want it. We use best Liverpool salt, about one oz. to every lb. of butter.

You can judge of how much butter you have by the amount of cream you had in the churn. Sift the salt into the churn through a fine hair sieve, put on the cover, turn the churn half around slowly for a few times to allow the salt to mix thoroughly with the granulated butter. Turn the churn around slowly removing the pin occasionally to allow any pickle that may gather in the churn to drain off, turn until the butter is formed into rolls and by that time the butter and salt will be thoroughly mixed. Lift the butter into a bowl with a wooden ladle and let it stand for eight hours. The hand should never be allowed to touch the butter. Cut the butter down through with the butter ladle and if white specks appear in the butter work them out with pressure. If the cream has been strained and has not been cooked in heating, or the water has not been put into the churn hot enough to cook the cream, and the churning is stopped when the particles of butter are no larger than flax seed, there will be no white specks in the butter. If no white specks appear the butter is worked enough.

Put up your butter into whatever kind of packages your customers prefer. We find that half lb. prints suit our customers best. We place our butter as it comes from the churn without any more working in half lb. prints, and wrap it in parchment paper with our name and address on it. We have two boxes fitted up with wooden trays like egg boxes holding 30 lb. each, and while one of these boxes is away being emptied we are filling the other. We get 25 cents per lb. the year round for our butter.

For the benefit of those who wish to pack their butter I will tell how we used to pack ours. In preparing the tub, fill it with fresh buttermilk and let it stand for twelve hours, then empty out the buttermilk and wash with cold water, using a brush. I would here say that butter makers would find it a great advantage if they would use a brush instead of a cloth when washing dairy utensils. Fill with boiling pickle, let it stand for twelve hours, and then scour with coarse salt, rinse with cold water, put in half a teacupful of salt, two tablespoonfuls of white sugar and one of saltpetre, cover with a cloth, then it is ready for the butter.

When filling the tub keep the butter high in the centre so as to run the pickle to the outside of the tub, as that is where butter spoils first. After the first churning is put in, cover with a cloth with an inch of salt over it to exclude the air; when adding each churning remove the cloth and put it on again until the tub is filled. Fill it within ¼ of an inch of the top, cover with two ply of cloth, press the cloth well down round the edge, cover with the following mixture: 1 lb salt, 2 oz. white sugar and 1 oz saltpetre, wet with boiling water and allow it to cool before using, and then spread it over the top of your tub. This will become perfectly hard and airtight. Have a rough box in your milkroom large enough to hold all the butter you will make in one season. As soon as the tub is filled put it into the rough box and cover with coarse salt to keep it from the air. Although we tell how we used to keep our butter we do not recommend packing butter.

We make butter as already described and have shipped it to Ottawa, a distance of 30 miles, for the last three years without using ice in shipping.

SOME VALUABLE FODDER CROPS.

By C. A. Zavitz, O. A. C., Guelph, Ont.

The use of fodder plants for soiling purposes and for supplementing pasture food is becoming more common each year in many parts of Ontario. Even now the merits of some of the most important of the fodder plants are not known but to a limited extent, and I venture to say that within a few years' time twice the present area will be devoted to these crops. In these days of keen competition and low prices it behooves every farmer to adopt those methods in farming which will give him the most remunerative results for

the labor and money expended. The farmer who is enabled to keep up the fertility of his farm, and also keep his land free from noxious weeds, and at the same time makes a cash profit from the production of the soil, is the man who will be looked upon as the *successful farmer*. During the past few years we have sent out from the Agricultural College a few of the most important fertilizers to farmers over Ontario, that they might apply them upon their own farms in order to determine what constituents were lacking in the land. The reports go to show that some of the farms over the province are in a high state of fertility, while others again are so much exhausted that they are unable to produce anything like satisfactory crops. This has resulted principally from the different modes of farming which have been adopted. Farms possessing the highest state of fertility are usually those which contain a large amount of live stock, and from which but little is sold except meat and dairy products, and where also the greatest care is exercised in the management of the manure and in its application to the soil. Ontario is becoming more and more a live-stock country, and where live stock is kept it is of the utmost importance that a large amount of the best kinds of food be produced from the land. It has been estimated that it requires three acres of the average pasture of Ontario to maintain one cattle beast during the summer season. The man who depends entirely upon pasture food in the summer season, and upon hay and straw in the winter, for the animals, is the one who is almost sure to be left in the race. Our pastures are very irregular. In the early part of the season there is rapid growth, but, later on, drouth is almost sure to come, and there is then a very limited growth of grass, and unless this is supplemented in some way the animals are almost sure to fall off in milk or flesh as the case may be. When this occurs it is very difficult to get the animals back to their normal condition again without an extra amount of feed and much loss in the returns. Fodder crops play a most important part in snpplementing the pasture land during the summer season, and especially in the driest period.

There are many fodder crops which are being grown at the present time, and a number of these are yet only in their experimental stage in this province. I will mention only a few of the most important ones with which we have experimented quite extensively during the past few years. In the first place I would mention

Winter Rye,

as it gives the earliest green crop in the spring of the year. This is an important crop for soiling purposes, and has been grown quite extensively at the Experimental Farm at Guelph during the past four or five years. We sow it from the 1st to the 15th of September at the rate of two to two and one-half bushels per acre. It grows rapidly in the autumn, gives an early growth in the spring, and the crop can be used in several ways. If desired it can be pastured off by the live stock of the farm, put in the silo for ensilage, cut green and carted to the stables for the stock, or it can be cut when coming into bloom and made into hay; or if not required for any of these purposes it can be allowed to ripen and threshed for the grain. We have used it in all these ways during the past four years. When we desire to make it into hay we have found it to be a good plan to cut the rye with a self-binder, shock it up as in the case of any grain crop, and allow it to dry out. In regard to the use of rye as a soiling crop, I take the following quotation from a bulletin prepared by the Pennsylvania Experimental Station, where experiments in the feeding of the crop were conducted, and careful analysis made to determine its digestibility: "Soiling rye obtained from the fertile soil when cut at the period of development when the head is about forming, possesses a not only larger proportion than was formerly supposed of material in such condition as to be valuable to the animal for milk production, but also when the constituents are present in such relative qualities as to fit the fodder for such use without the addition of other more concentrated nitrogenous fodders." After the rye crop is finished in the spring the clovers might be used for the next supply of green food. The common red clover requires no description, but I desire to give our experience with

Lucerne.

During the past few years many experiments have been carried on with lucerne, not only at our experimental station but also over Ontario by farmers in different localities. It is found that while we cannot expect to receive such enormous crops of lucerne as is obtained in Colorado, California, and some of the more southerly states, still in localities of Ontario, where the land is suitable, lucerne has been found to grow quite successfully. It flourishes best upon a soil of a gravelly nature, and especially does it like a subsoil which is well drained and possessed of a considerable amount of lime. I received a report from one farmer in Ontario, just before I left for Institute work, who said he had received four crops from his lucerne during the past season; from another that he had received three crops, and from others that had received two crops during the season, while again others spoke of failures. The lucerne is usually sown at the rate of about eighteen pounds per acre in the spring, in much the same manner that red clover is sown. It is apt to do well when sown with about one bushel of barley per acre. It is best to allow the lucerne to grow after the barley crop is taken off the land unless there is a very luxuriant growth in the autumn of the year, and even then it is best not to remove it too closely to the ground during the first year. When lucerne is well established in the soil for which it is well suited, it sometimes remains for a large number of years. Lucerne is the deepest rooted plant which we cultivate, and, like the red clover, is an excellent crop for the land.

Peas and Oats.

We have experimented to a considerable extent in growing grains in various combinations for fodder purposes, using in all eleven different mixtures of oats, barley, spring wheat and peas. We have found that we have received the largest average yield per acre from growing peas and oats combined. In another line of experimental work, in which we used different relative quantities of each of the grains in the pea and oat combination, we found that the largest yield per acre was obtained from sowing one and one-half bushels of oats and one bushel of peas together. When a stiff strawed variety of oats is used, the crop usually stands up fairly well. Not only does the combination of peas and oats give a large yield per acre, but it also supplies a food of most excellent quality. If the crop is not required as a green fodder in supplementing the pasture grass it can be cut and made into hay for winter use, or it can be allowed to ripen and then threshed. We have found in our experimental work that we have received a larger amount of grain per acre from the various combinations than when the same grains were used separately.

Millet.

During the past three years we have carried on experiments with a number of varieties of millet, and find that some of them are much more suitable for fodder purposes than other varieties. The Salzer's Dakota millet has given the best results of all the varieties which we have tested in our trial grounds. This variety has also done well over Ontario in experiments where it was grown along with two other varieties in various localities, the seed being sent out from the Agricultural College by the Ontario Agricultural and Experimental Union. Millet is usually sown about the first week of June, and at the rate of about forty pounds per acre. It is an important crop, not only to supplement the pasture lands, but also to supply a quantity of food for winter, in case the hay crop or the corn crop is a partial failure. When converted into hay it should be cut just when the heads have formed.

Fodder Corn.

The corn crop is by far the most important of all the crops which are used for fodder purposes in many parts of Ontario. When on a Farmers' Institute trip in the northern part of the province in January, 1893, I was somewhat surprised to find thoroughly matured corn, which had been produced along the northern side of Lake Superior, and I

learned from the farmers, while in that section of the country, that even there corn of their own raising formed an important crop for feeding purposes. Of course the early varieties were used.

In 1893 we grew ninety-three varieties of fodder corn in our trial grounds at Guelph, and for the past three years, sixty-four varieties have been grown in succession. There is a great difference in the varieties, some yielding more than double the quantity of food of others. What we aim at is to secure the varieties of corn which will produce the largest total weight per acre with the largest amount of grain, and also which will reach maturity before the early frosts in the autumn. Among the sixty-four varieties which have been grown at Guelph during the past three years, six kinds were chosen and sent out to farmers over Ontario in the spring of 1893. We received thirty-five complete reports of carefully conducted experiments, and the average of those thirty-five reports is here presented :

Varieties.	Average of thirty-five co-operative tests, 1893.		Average of Experiment Station tests—two years, 1892-3.	
	Weight of green ears per acre.	Total weight per acre.	Weight of green ears per acre.	Total weight per acre.
	Tons.	Tons.	Tons.	Tons.
Mammoth White Surprise	2.4	17.5	1.1	24.3
Thoroughbred White Flint	3.5	15.9	2.1	22.2
Giant Beauty	3.0	15.5	3.7	23.0
Mammoth Cuban	3.4	15.2	3.9	19.7
Wisconsin Earliest White Dent	3.6	14.1	3.9	17.0
Salzer's North Dakota	3.5	13	3.4	18.4

You can see that these varieties are arranged according to their average total weight per acre in the co-operative tests The Mammoth White Surprise has given the largest average yield per acre, and the Salzer's North Dakota has given the smallest. The first mentioned variety is, however, very much later in reaching maturity than the latter. In fact, they may be said to be arranged in the order of their maturity also ; the Salzer's North Dakota being the earliest to mature and the Mammoth White Surprise being the last. These are all varieties of very excellent quality, and one or more of them should be suitable for every locality and every soil in our province. The Mammoth Cuban and the Wisconsin Earliest White Dent varieties are both favorites at the Experimental Farm at Guelph. It is of great importance to grow a variety of corn which will become matured in the locality where it is grown, as the plant increases very considerably in valuable food constituents as it approaches the ripening period. The crop can be fed in the green state, placed in the silo, or cured in the field. Whichever way it is used, it is considered by far the best plan to plant the corn in drills or in hills. In experiments which we have conducted we have found that in every case we have received a little greater yield of grain per acre from the hills than from the drills. At the Experimental Farm at Guelph the corn crop is used for green fodder in the autumn of the year, and for ensilage during the winter and spring. We consider the ensilage one of the cheapest and most important kinds of food which we can possibly obtain.

Rape.

The rape crop is, as yet, but little known over the province, but as time goes on this crop is almost sure to become better appreciated. We have had a good deal of experience with rape during the past four years, and appreciate its value more and more as we understand its excellent qualities. It is usually sown as the second crop upon the land during the same year, and principally after the rye crop, but sometimes as a catch crop after the winter wheat has been harvested. When growing rape after winter wheat we have been enabled to pasture as many as twenty-seven lambs per acre for a period of

twenty-five days, the lambs receiving nothing whatever except the rape and salt, and they have increased in live weight about six pounds per head during that length of time. Upon rape which has followed winter rye we have pastured as many as 650 sheep in one autumn, and about 500 during another season ; one acre of rape would pasture from ten to sixteen lambs for a period of two and one-half months, and the lambs would increase in live weight from eight to ten pounds per month. We have also found rape to make a good pasture for steers and also a valuable soiling crop for steers, sheep and hogs. It can be cut and thrown in heaps in the field and allowed to remain there for weeks without apparent injury before being hauled to the stables for feeding.

Rape is usually sown during the last week in June or the first week in July, in much the same way as Swede turnips. From one to two pounds of seed per acre is quite sufficient when the rape is sown in drills twenty-five to thirty inches apart. It is found to be a great advantage to apply about one hundred pounds per acre of nitrate of soda to the land when the young plants are about two inches in height. The soil should be cultivated occasionally, and by the middle or the end of September the crop usually reaches a sufficient stage of maturity to be used either for pasture or for soiling purposes. It is greatly relished by the animals, is a very rich food, and one especially adapted for the fattening of sheep and for lambs. I believe there is no better way of cleaning the farm of foul weeds, of keeping up the fertility of the soil, and of getting a large production from the land, than by the judicious growing of fodder crops. To bring this about it is of the utmost importance to give thorough cultivation to the soil, to feed the crops to the live stock on the farm, to take the best of care of the liquid as well as of the solid part of the manure, and to apply this to the land in the most economical way. I am of the firm opinion that there is no better way of manuring the soil than through the animals, of cleaning the land than by growing two fodder crops in the same season, and of making a success of farming than by applying brains to our every-day work.

POULTRY CULTURE.

By L. G. Pequegnat, New Hamburg, Ont.

In attempting to say a few words on poultry culture, my intention is not to take much of your valuable time ; but should I succeed in being a help to those wishing to enter one of the most profitable enterprises on the farm, —and not on the farm only, but also in towns and villages, as it is a business that the rich, the poor, the professional, as well as the working man, can pursue, and when well understood is a business that will realize a fair profit with a little capital invested,—then I shall feel I have only done a part of my duty towards my fellow man.

A man may start a business without serving his time as an apprentice, and I would not venture to say that he would not make a successful business man, but he will have more or less to pay dearly for his experience. I would, therefore, advise those wishing to go into the poultry raising to be very careful in the first place in selecting good stock, and to settle their minds on the variety that they wish to keep, as most varieties have their good qualities as well as defects. Above all, if they want to be successful breeders, they must be lovers of feathered stock, otherwise they will be sure to make it a failure. I am pleased to observe that a great many of our farmers are beginning to see that the poultry industry pays when well kept. They are not only keeping fowl, but they are well aware that a well bred hen does not cost any more to raise than a common one. But perhaps some of you may say which is the most profitable breed to start with, and how should I keep them for best result?

One lover of horses may say give me the heavy draught, and another say that the trotting stock is his choice, while another may give me the general purpose animal. One is too heavy, the other too fast. I want one that I can use anywhere. My choice as a poultry breeder for the last twelve years has been to select a general purpose fowl ; one that can fill the basket with the most beautiful eggs of rich color, and one that can realize

the most profit on the market for table use ; and I consider that there is no better variety than the Plymouth Rocks, Wyandottes, Black Minorcas, Partridge Cochins and Black Javas.

As to the keeping for best results it should be carefully handled, and good judgment is required. Overcrowding is a great mistake. Fifty hens will lay more eggs in a house and yard just large enough for that number than one hundred will in the same space. Neglecting to keep the house clean invites disease to enter. In the case of young stock it stops their growth. Over feeding is another injury to both young and old fowl. Young stock should be fed often and old stock should be taught to work for their living. There is not much danger of the Leghorn family getting too fat, as they are naturally more active, but it will soon tell on the varieties above mentioned. A hen should not be kept over three years, or she will not pay ; but she will then make a good broiler. There is danger, when fowls are over fat, of losing them. A Rock hen, at the age of two years, will weigh from 7 to 9 pounds, and she will realize about 50 cents dressed ; but 9 times out of 10 when too fat will die suddenly, as I found to be the case, and that means a loss every time. Eggs from such specimens are generally unfertile. A lack of variety of food, too much corn and not enough green food, the feeding of damaged grain because of its cheapness, lack of gravel or shells and meat, not a daily supply of fresh water, damp quarters, the keeping of roosters wanting in vigor, breeding from too young a stock and hatching chicks later than the month of July, are all defects which prevent a poultry man from being successful.

In closing I will give you a few hints on how to raise young chickens. When hatched they should be provided with coops out of reach of all danger, separated from the old flock, and out of reach of their worst enemies, the rats, cats and dogs. Be careful that they are well protected at night, well closed in and about twenty to fifty yards from your poultry house.

I find that a chicken hatched from April to the 15th of June is worth half a dozen hatched later. They will begin to lay when eggs are fetching a good price, will be of larger size for market, and also can stand the winter months better.

Do not keep more than one cock for every 12 to 14 hens. By taking my advice you will find that keeping poultry will be a pleasure as well as a profit.

THE BEST DAIRY COW FOR THE FARMER.

By T. B. Scott, Vanneck, Ont.

In speaking upon a subject so complicated I must confine myself to the general characteristics of each breed. We look for exceptions among impure breeds ; uniformity is what we expect from pure blood.

The Ayrshire is a handsome, thrifty cow and gives a good, continuous flow of milk, of fair average quality. The separation of the cream from the milk is slow and imperfect, and this makes it suitable for city, town and village delivery, every customer getting the same quality, and after skimming it looks white with no watery appearance. This may also be an advantage when delivering night milk to cheese factories, but becomes a great disadvantage at the end of the cheese season. There will still be three to five months' milk to convert into butter. The rising of the cream will be slow and imperfect, the separation of butter from cream be equally slow. The Ayrshire is not a butter cow. This breed created great interest in the pavilion at Chicago. They were placed by the judges in a row according to merit with 16 hours' milk in their bags—Drummond's white cow at the top, her bag measuring 5 ft. 5 in. They were then sent round the pavilion as they stood by merit. Every visitor saw each cow and where she was placed. They were then milked and brought back with empty bags, placed in a row again with weigh of milk and got their final mark.

The Holstein has nothing that I know of to commend her. She has a coarse frame, which indicates a hard keeper, and when the quantity of milk is satisfactory the quality is disappointing. Her own friends had no confidence in her, and bolted the Chicago test.

The Butter Breeds. The Jersey, Guernsey and Alderney are each special butter breeds. None of these breeds are as well adapted to city delivery as the Ayrshire. The butter globules in the milk of the Jersey are large and the separation of butter fats very rapid and very perfect, and when the cream is removed the milk has a dark and somewhat watery appearance. These very qualities, however, that unfit her for city delivery make her the queen of butter cows. I have not time to speak of the Guernsey and Alderney; neither are the equal of the Jersey, and I have no use for them.

The associations of all the breeds of dairy cattle knew what this World's Fair test meant. It meant that no cow that did not possess great merit, coupled with great constitional vigor, need apply. The conditions were extremely adverse — hot stables, swarms of flies, absence for a long period of green, succulent, cooling food, and a constant stream of visitors. Under these conditions no cow could do her best; yet the little Jersey gave more at the end of the test than at the beginning. The best cow for the common farmer is my subject. If that means the general purpose cow, then we say the old Shorthorn fills the bill. Where special dairy breeds dare not tread, the old Shorthorn boldly walked in and did honor to herself and her many admirers, and when the best lot of beef cattle the world ever saw together both in individual merit and numbers were inspected, the Shorthorn was at the top. There was a general purpose clause in the Chicago dairy test that favored the Shorthorn over the Jersey, viz., allowing 4½ cents per lb. for every lb. of gain in live weight. Notwithstanding this against the Jersey she gave 7,215 lb. more milk, 1,383 lb. more butter, $489 89 more money; average per cow per day 17½ cents. The two-year-old heifer test was a good illustration of this general purpose clause. The Shorthorn heifers went into the test thin and made a daily gain of 3¼ lb. per day per head. Taking 15 cents out of each day's ration and storing it in her frame. If they continue to milk for 10 years which they will likely do, where will you get the 15 cents per day? The Jersey in this as in all other tests gave a strong lead and gave it back in spot cash.

If we go into dairying it is to make money. Then is it not best for the common farmer as well as for all farmers to give the feed to the cow that gives him most back? That cow is the Jersey.

Why not have a special purpose rather than a general purpose cow. If our chairman was to go into the livery business and fill his stables with Clydesdale horses we certainly would not commend him for sagacity. Not many men make the absurd blunder of hoeing corn with an ax or cutting wood with a hoe.

Those who wish to learn from the World's Fair test can see that there was nothing of uncertainity or accident about it. Analyze it, and this is what we find: The best one cow was a Jersey, 2nd Guernsey, 3rd Shorthorn. Best five cows, 1st Jersey, 2nd Guernsey, 3rd Shorthorn. Best twenty-five cows, 1st Jersey, 2nd Guernsey, 3rd Shorthorn. Average of the 74 cows, $34.68. Thirty-seven cows went above the average. Twenty-one of these were Jersey, nine Guernsey and seven Shorthorn. I would advise all to have a special purpose and get the cow best adapted to that purpose.

BREEDING AND FEEDING SWINE.

By Robert Baird, Chesterfield, Ont.

Until within the past few years the farmers of Ontario have paid very little attention to this class of farm stock, but the low prices that have prevailed for grain and the high prices that have ruled for hogs have created quite a boom in hogs in this locality.

Although prices have fallen considerably it is yet considered to be one of the most profitable branches of farming by all those who have gone into the business of feeding hogs.

During the past year a great many new piggeries have been built, and in these a great improvement can be noted over the old style stone dungeon with one window in the gable end.

A piggery should have plenty of large windows, good ventilation, and so warm that the pigs are quite comfortable even on the coldest days of winter.

There should also be a loft overhead for bedding as it will be found a great deal more convenient to keep the pigs clean than it is when the straw has to be carried to them, and as a rule on cold stormy days when pigs need the most bedding they get the least if it has to be carried to them.

In selecting a sow for breeding we should choose one of good length, small head, light neck, ribs well sprung, broad loin, hams well let down, and she should have from twelve to sixteen teats, starting as near as possible to the fore legs, and evenly placed, thus giving the young pigs more room to suck.

After the sow has been bred, her feed up to the time of farrowing should be of a kind to keep her in good condition, but not too fat.

In summer, pasture with a little grain and plenty of fresh water will be all she requires.

I am satisfied that the cause of so many young pigs dying in spring litters, when farrowed, is that the mothers were fed an excessive quantity of roots during the winter. I would feed a few roots and some grain and water, but no swill.

Ten days before the sow is due to farrow, place her in a pen not less than 9 x 12 feet, and give her a rather limited supply of cut straw for bedding.

When the young pigs are three weeks old, give them some chopped wheat and oats, dry, and give them skim milk as soon as they can be induced to drink, in a pen apart from their mother.

I would wean them at six weeks old and then feed them all they will eat up clean four or five times a day. It is a good plan to clean out their troughs as soon as they stop eating; they are then always ready for the next meal.

I would give them their meal dry and also give all the skim milk they can drink. Keep them perfectly clean by frequent cleaning of the pen and plenty of dry straw.

The first two months of a pig's life are the most important, and we should guard against the little pigs receiving any check at this period, by giving them our best attention.

Right here I want to advocate a practice not generally followed by the farmers, that is, to brush and curry hogs. I have found the best things for doing this are, a hoe and good stiff brush. We think it is just as necessary to clean pigs as it is to clean fattening steers. I claim that a pig will not make the best use of his food unless his skin is kept thoroughly clean.

Our practice is to feed pigs all the chopped grain and skim milk they will eat until they are from 5½ to 6½ months old and then they are always sold alive, and weigh from 200 up to 250 pounds each. We aim to sell a load of hogs nearly every month in the year. The average weight of the last two loads we sold was: first load, sold December 4th, age 191 days, average weight 234 lbs.; second load, sold January 16th, age 205 days, average weight 239 lbs. While we do not think these are extraordinary weights, they are good weights, and prove that it is a useless waste of time to keep a hog longer than six months. Therefore we would make the pig's life about one half shorter that it was in the old fashioned way of keeping them for nine months on starvation and then stuffing them for the last three months. His life, though short, is sweet in comparison to the old way, when for nine months the pigs had a long felt want in their stomachs that was never filled.

SUCCESS ON THE FARM.

By L. Patton, Oxford Mills, Ont.

To be successful on the farm in these times requires that the tiller of the soil shall be something more than just a mere mechanical farmer. There are too many men who do not believe in any special study of the business, nor in anything but the hardest kind of

work and a continual swearing that "the business don't pay." It has been said by some one that "The only thing that can be sold off the farm at a profit is skill," and I think the more we consider this statement, the more we will be impressed with its truthfulness.

Too many farmers look upon the product of their farms, not as manufactured goods but as so much raw material. Now this is a great mistake, and the man who manages his farm successfully must look upon himself as a manufacturer, and the beef, pork, butter, cheese, or whatever he may have to dispose of, as his finished product. Then by endeavoring to keep down the cost of production to the very lowest possible point he will find his profits very materially increased. A great many farmers are constantly complaining about the markets and the extremely low prices that prevail for farm products. Now if one man produces a pound of butter for twelve cents and sells it for twenty cents he has just as great a profit as his neighbor would have who produces a pound of butter at a cost of twenty cents if he could market it at twenty-eight cents. The market end of the business we cannot control only in so far as we succeed in producing an article of superior excellence, and that will find a ready sale at the very highest price; but the man who gives his undivided attention to the home end of his business, who practices the close economy of the successful manufacturer, will find he has entered a more profitable field of labor than endeavoring to boom the markets or to overthrow the monopolists or combines that he fancies are robbing him of the product of his toil.

Such a farmer will not leave his farm implements lying about the fields where last used, exposed to all kinds of weather, and to wear but one-half the time they would if properly housed and cared for, but will practice habits of method and order—will have a place for everything and everything in its place. No time will be lost hunting for tools that have been carelessly thrown down and forgotten: no money wasted buying new implements to replace those that have rotted and become useless through exposure or need of a seasonable coat of paint; every minute and every dollar expended unnecessarily adds so much to the cost of production and lessens the profits accordingly.

The successful farmer must be an enthusiastic one—he farms not from necessity, but because he loves his occupation. Many men who have neither capital nor experience adopt farming for a business and then wonder that they fail. Muscle without brains on the farm is like a ship at sea without a compass. The voyage, to say the least, is very uncertain and is usually attended with humiliation and disaster. It is very important that we should know what we can do best—what comes most natural and easy for us, and it is of no less importance that we know this at the start. Begin right and then there will be no need of a change. The man who makes frequent changes from one business to another will not succeed. Some men who last year were in the dairy business this year are going into raising hogs extensively on account of the high prices that have been paid during the past season for pork. By the time they get well established in the hog business pork will be away down and then they will try sheep raising with similar results. With such men whenever it rains mush and milk their dish is wrong side up. He is a dull fellow who gains nothing by experience. The longer we follow a given way the more familiar it becomes. To change after this is to lose much of the benefit of our former experience. Hence the necessity of a right start. A blunder here may cost us the race.

The prosperous farmer in these dull times must follow in the footsteps of the successful manufacturer or merchant in keeping strict account of his business. The average farmer has no more idea of what it costs him to produce a bushel of wheat or oats, a pound of beef or bacon than the man in the moon. He dreads mental work, and perfers working sixteen hours a day without knowing whether he will get any returns for his labor, rather than devote a few minutes each day to keeping an accurate account of what it costs him to run each branch of his farm work so that at the end of the year he may be able to tell what branch of his farm operations has made him a profit and wherein he has lost money.

We know very well that the merchant who fails to keep strict account of his business will have the sheriff in charge in a very short time; and we are forced to the conclusion that farming is the best business in the world or there would be more failures than there

really are; but the farmer who for one year will keep an accurate account of his receipts and expenditures with his dairy, his wheat field or any special line of farm work that he may be engaged in, will find that the fund of information to be gained from such a source will enable him to farm more intelligently than he has down hitherto and to cut off many leaks that he has previously known nothing about. He cannot stop a leak until he has found it, and I cannot conceive of any way of finding them expect by keeping accurate accounts of his business.

Another thing that is of the utmost importance to the man who wishes to succeed is the keeping up of the fertility of the soil. Every farmer should try to put into practice the old maxim "Feed the soil and it will feed you." Too many farmers in this country have been acting the part of the prodigal, and have been drawing upon the fertility in the soil year by year for the means of living without making any returns, until their farms are in a great measure exhausted. The only remedy for these men is to quit selling the hay and grain off their farms, and dispose of it through the medium of the cow as beef or butter or cheese, or through the hog as pork or bacon. By so doing a large percentage of the fertility of the soil will be left on the farm to be again available as plant food, and by growing leguminous crops, such as peas, and clover, much can be done to restore our exhausted farms to their wonted fertility. But many farmers who feed their hay and grain on the farm do not seem to have a clear estimate of their losses in dollars and cents through not taking proper care of the manure made on the farm. Men who will otherwise save every grain and every nickel, throw away many dollars every year in the shape of manure by letting the largest and best part of it go to waste. How is such waste to be prevented? Our scientists tell us that the liquid part of the manure constitutes at least one-half the manurial value of an animal, consequently our first aim should be to save that as much as possible. The only place to save it being the stables, the floors must be made watertight to prevent the liquid from soaking into the ground. The next important thing is to have an absorbent. Land plaster is very highly recommended for this purpose and helps to retain the ammonia. Cut straw answers for this purpose, and where it can be readily obtained dry muck is excellent, and a small quantity thrown into the gutter behind the cattle gives the liquid part of the manure enough consistency to be easily taken up. Many people have practiced dumping the manure in the barn yard during the winter and leaving it there to leach until some time during the coming summer. This is also very wasteful, as the best part of the manure will be leached away. The better plan would be to take it directly to the field as made; there will be a great saving in time and labor in avoiding handling a second time when there is more to do, and, unless spread on a side hill when the ground is frozen or covered with snow, there will be practically no loss from leaching.

Then the farmer who succeeds will propagate from the best. Experiments made on our experimental farms go to show that only by using seed of the very best quality can we hope to have the best results, and we do not need to take any chances as to which are the best varieties.

By referring to the printed reports of these experiments we can readily ascertain the varieties that have given best results throughout the different sections of the province. The same rule holds good with stock, the scrub hog and cow will have to give place to those of better breeding; the scrub method of handling and feeding and stabling will have to give place to improved methods of feeding; better stables and more intelligent management, if the results are to be satisfactory. The man who sows to the north-west wind in caring for his cows need not expect to reap a pocketful of golden dollars.

Close attention to details make up the aggregate of profits. If we ever take our place among the business men of earth to which the laws of nature entitle us, it will be when we make the very best possible use of the means at our disposal. I mean it will be when we provide ourselves with the very best agricultural papers printed for our use; when we regularly attend our Farmers' Institutes which afford us a maximum amount of information at a minimum cost; when we cease to educate our brightest boys at the literary colleges in order to send them into the learned professions; it will be when we give them a thorough agricultural education so they may understand the possibilities of

the soil and the feeding value of the different products of the farm. There is no business in which a diversified knowledge is so essential. The man who does not love farming, but follows it as a hated necessity is the man who will degrade the profession as far as a noble employment can be degraded.

EDUCATION FOR FARMERS.

By J. Armstrong, Danforth, Ont.

I am well aware of my own inability to do the subject justice. My object in taking it up is to draw your attention to a matter to which I think we do not give that consideration which its importance deserves, and if I succeed in causing you to think on the subject, then this paper will have accomplished its purpose

Our education really begins with our life and should end only with it. But for the purpose of this paper, we may begin with the common schools and what should be taught in them. As now conducted much fault cannot be found with our common schools with the exception that more attention should be paid to agriculture and subjects bearing on it. They do not carry the pupil far enough.

In rural schools these subjects should be made obligatory and not left optional with teacher or pupil.

A farmer should be educated in a manner to fit him for the calling or business he intends to follow. His education should be somewhat technical, if I may be allowed to use the term in that relation.

If you intend your son to take a profession you educate him for that particular one he may choose to follow. Whether it be law, medicine, engineering, or any other, his education must be of such a nature as will fit him for it. Then why should not a farmer's education be conducted in a like manner? Teach the boy that which will be a help to him in his business; teach him what will make him like it better and will make him have more respect for his own calling, and then both he and it will be more respected by others. Education has raised the professions to their present eminence in the state, and it would also raise agriculture to the first place, as it is the greatest interest of our country.

But, I do not claim that we can turn out from our schools ready-made farmers, as it were. To have the theory is a gain, but theory alone will not accomplish much. Mr. Hains, that eminent agriculturist of New York state, said that he had been taught agriculture in a scientific manner, but he had seen a Yorkshireman take a worn out farm and bring it into a high state of cultivation sooner than he could. We must have a practical training on the farm to get that knowledge of farm life, farm work, and all the interior economies appertaining thereto to become successful farmers.

But, my plea is not so much that the farmer does not receive the right kind of education, but that he does not get enough of any sort—that his education is altogether too limited.

If a lawyer studied only law, a doctor only medicine, or a minister only theology, such courses would make very narrow-minded men of them—men who never would attain eminence in their professions, or become prominent outside of them.

Education to the individual is somewhat like good cultivation to a farm; the more thorough it is the more will be got out of the subject.

Therefore I claim that more education of the farmer would make him enjoy life better, make him a better farmer and a better citizen. Education alone can give farmers that influence and power in state affairs which their numbers entitle them to have.

But some wiseacre will say, "Oh, you are going to educate the boy off the farm." I think there is no danger of that. Some are leaving now without education, others are leaving to get it and again others have left the farm and by so doing have been of great benefit to the state. We have heard a great deal of trash about "Keeping the boy on

the farm," and "How to keep the boy on the farm." I confess to be of Mark Twain's opinion on this: "If he really must be kept there, you had better tie him up." The right way to keep the boy on the farm is to educate him to stay on it.

How much influence have the farmers to-day either financially or politically? They have very little indeed. And why? I say for want of education.

Why are we educated at all? Is it merely that we may adopt the thoughts and opinions of others? No. The rather, we are educated to enable us to think for ourselves.

Have we, as farmers, been thinking for ourselves? Have we not been in the habit of taking or receiving our opinions on all social and political questions ready-made from others? That is why they fit so badly.

Farmers, educate yourselves, so that you may be enabled to think for yourselves. Then you will take that place in the state you should occupy. You can give your country honest, economical government.

It is not my purpose to point out remedies or to devise ways and means. It is sufficient if your attention is directed to this subject and you are made to think about it.

SOIL PREPARATION FOR THE GROWING OF CROPS.

By T. G. Raynor, Rosehall, Ont.

A large measure of success in farming depends upon the autumn and spring cultivation of the soil intended for cereal crops.

The object of nearly every farmer is, to get maximum results from minimum outlay. In order to accomplish this end, a farmer should have a well developed plan in his mind of some system of rotation in cropping, as well as a knowledge of the nature and fertility of the soil which he tills.

The reasons for a system of rotation in cropping may be summed up as follows: (1) To clean the land of noxious weeds; (2) to economize the elements of plant food manufactured in the soil or applied as fertilizers; and (3) to fit the soil for producing the largest possible crops from year to year.

Following are some guiding principles in a system of rotation:

(1) A deep-rooted crop should be followed by a shallow growing one. For instance, red clover is a deep-rooted crop, and its roots go deeply into the soil. They have the power of attacking some of the insoluble elements of fertility in the subsoil, and of depositing some of them in their roots. On plowing these up, in their decay they leave the surface soil richer in plant food than before it was seeded down. Barley and turnips, which are shallow growing crops require plant food at the surface, and do well to follow a crop of clover.

(2) Some plants behave differently towards the elements of fertility in the soil. Thus, wheat draws largely on the nitrates in the soil, barley and turnips on the phosphoric acid, while potatoes and corn like plenty of potash. By alternating these crops we do not exhaust the soil of any one of these ingredients, as is the case when barley or wheat is sown in succession for a number of years on the same soil, without the application of fertilizers.

(3) Plants differ as to their periods of growth. Some crops are sown in the fall and are able to assimilate much of the accumulated nitrates formed during the summer season. Spring crops may not be able to draw from this source so well, as often these elements are subject to waste. Midsummer crops also have a decided advantage over some spring crops in this way, as they have a longer period of growth, and grow at a time when the elements of fertility are made available.

(4) Plants differ as to their power of absorbing nitrogen. Clover, peas and beans are nitrogen gatherers. They have the power of utilizing the free nitrogen of the atmosphere. The roots of these crops are also provided with small nodules which are special nitrogen feeders. It is very important that non-nitrogen-gathering crops be followed with nitrogen-gatherers.

Preparation for Fall Grains. Observing these principles it will be well to commence with the preparation of soil needed for the growth of fall or winter cereals, as wheat and rye. One of the best preparations for fall wheat is a summer fallow. As this would be unnecessary, if such a system as the one referred to be followed, then one of the best chances would be to plow up a clover sod, after the hay crop is removed, and follow that plowing with repeated stirring of the soil with the cultivator and harrow; but on the surface as much as possible. The seed-bed for fall wheat does not require to be deep, two or three inches is sufficient, and the firmer the soil is below that depth the better. Another good chance is after a pea crop has been removed, provided the land be clean. Cultivate and harrow the surface thoroughly, and then sow the seed with a drill. The seed bed for rye may be prepared similarly, only such good chances are not required to insure a good crop.

Preparation for Spring Crops. Commence with early after-harvest cultivation for all spring crops. Plow the land lightly with a gang plow, then cultivate and harrow as frequently as possible. Too much of it cannot be done, unless the soil be too wet to work. Later in the fall plow for the last time, throwing the soil up to the action of the frost. Fields intended for shallow-rooted crops plow shallow. This applies, too, to the lighter classes of soils. Care should be taken not to plow heavy soils when too wet, as more injury than good may arise from such a course. On those fields which are intended to be seeded down with grass seed or clover, it is a good plan to haul the manure fresh from the stables in winter as a top dressing. It should not be done, however, if the snow be deep or the land too rolling. If the manure applied in this way be thoroughly incorporated in the soil, by thorough spring cultivation with harrow and cultivator, a good catch of the grass seeds is ensured.

Spring Preparation of the Seed Bed. Commence working the land as early in spring as possible. Fit the ground before seeding, by getting a good fine tilth to the depth of two or three inches for barley, and four or five inches for peas and oats. With a favorable season grain drilled in is preferable to broad casting.

Preparation for Buckwheat. Once plowing in the fall may be of great benefit to a field intended for a crop of buckwheat, especially if the field be foul with couch grass. A light plowing in the fall seriously injures this noxious pest. Spring cultivation is usually all that is necessary. The ground for this crop is usually fitted after spring's work, when it should be plowed and thoroughly cultivated from time to time until the seeding time. The manure may be applied to this crop with advantage. Just before seeding plow lightly with a gang plow, then follow with the harrow and seeder.

Preparation for Hoe Crops. Much the same preparation is applicable to hoe crops as is recommended for buckwheat, where one object in view is to clean the land of noxious weeds. One of the very best chances is after a crop of clover, either mown for hay and then plowed or plowed under as a green manure. A fine seed-bed and level cultivation, with plenty of it, will usually ensure a good root crop.

BREEDING AND FEEDING PIGS.

By W. H. McNish, Lyn, Ont.

For many years our farming methods have partaken of the nature of a spendthrift's waste and squandering of his legacy.

Blessed by nature with a fertile soil and fine climate there has been a feeling that these stores of wealth and fertility were inexhaustible—a feeling from which there was a rude awakening, when, after years of continuous cropping, our farms were becoming impoverished and our crops shrinking far below the paying point.

The change to dairying which followed was decidedly in the right direction. Farmers who adopted it have the satisfaction of seeing their yearly receipts increasing and their farms becoming more fertile; but I feel that the part of dairying which is most profitable is the part at present most neglected.

The fact which I wish to impress upon your minds is this : that dairying and hog-raising go hand in hand ; that they are twin industries, and in the latter lies the most profitable part of dairying.

These assertions I base not on mere supposition and theory, but upon my own actual experience ; I have learned that there is no animal on the farm which will yield so handsome a return for the time and money expended on it as the pig.

The hog is an animal whose many good qualities are not fully appreciated and whose claims on our attention are not fully recognized. Requiring no expensive quarters, hardy, thrifty and prolific breeders, they possess the merit of growing and thriving on food that would be rejected by other animals. It is that latter quality that makes them specially valuable on a dairy farm. We can say we have attained the highest degree of success in farming only when we have learned to turn all the products of no market value into something which is a marketable commodity. The refuse from the dairy is of no market value, and there is no medium through which it can be turned in dollars and cents so well as by means of the pig.

There is no reason why this country cannot raise enough to supply its own needs and export large quantities. At one time Canada imported annually $2,000,000, worth of hogs and their products, but we have overcome that and are now exporting, but only in small quantities. There is practically an unlimited demand for bacon in Great Britain.

Modern methods of curing are making it so palatable that it is taking the place of other meats. Last year Great Britain imported $50,000,000 worth of bacon and hams. Of this amount Canada supplied 6 per cent. There is a greater demand in England for Canadian bacon than for the U. S. product, and for this reason it commands two cents a pound more. This fact can be connected with the fact that there is annually going to waste on the dairy farms of Canada enough good feed, which if directed in the right channels would put thousands of dollars into the farmers' pockets. There is no way that we can use the waste whey, butter-milk and skim-milk to the same advantage as with the pig. The question has not been properly settled, as to the number of pigs a dairy can keep profitably ; I think, however, it should turn off at least two porkers to every cow in milk.

It must be remembered too, that the hog sought after a few years ago—those great lumps of fat—are no longer in demand, very happily for the farmer, as they are the most unprofitable to raise.

The hog we must produce to meet the taste of the customer of to-day is an animal weighing from 150 to 200 lb., a figure which can be reached in six months. For an animal of that class there is to-day an almost unlimited demand, and there need be no fear of an over production or that the market will become glutted. There is no good reason why Canadian dairy fed bacon should not stand as high in the eyes of the world as the Canadian cheese of to-day.

The accomodations required for the hog need not be expensive. In their construction, however, four points must be observed. They must be dry, warm, convenient and well ventilated, so as the inmates are always comfortable.

I feel that I cannot urge upon my fellow-farmers too strongly to take hold of this industry in conjunction with dairying. Therein lies a source of profit too often neglected, and anyone who tries it will be surprised at the revenue it yields. For several years we have heard loud complaints among our farmers of hard times, and hard indeed they have been with many, but instead of sitting down and wringing our hands in despair it is more befitting to us as men to look about us ; to examine our farming methods and see if therein did not lie most of the difficulty ; and then put into practice better and more profitable ways of turning the produce of the farm into the welcome and coveted dollar.

I believe that pig-raising in connection with dairying is at least a partial solution of the problem of hard times amongst our farmers. For success in pig raising, there is nothing so essential in order to render the undertaking profitable, as a good brood sow. She is like the goose that lays the golden egg, but more than one at a time ; hence in selecting a young sow it is of the utmost importance to see that she be possessed of the characteristics which are obviously adapted to that end. It must be understood that I am not referring to the fancy points of any particular breed, but rather to those which are to a great

extent applicable to all breeds, and which are conducive to the greatest profit, viz., proliticness and maternal solicitude. In the first place, then, I should insist on great length as well as depth, and the teats should not number less than twelve. Length gives more space for the young pigs to suckle, and they will not fight and crowd so much, and it is besides usually a concomitant of a good number of teats, while depth I have found to be an indictation of a propensity to large litters.

In the next place temper is important, although even quick-tempered sows can be made tractable by kindness. At farrowing time, one is sometimes of necessity compelled to be working around the sow, and nothing is so unpleasant as being compelled to be ready to leap out of the pen at a moment's notice.

Having secured such an animal, the next point of importance is to breed her to a good boar and just here a mistake is often made. Don't use a scrub, because he is convenient and cheap. It all cases I would strongly advise the use of pure bred sires. Be sure to keep a note of the date of service so that you will not do like too many, *i. e.* go out some morning and find that your sow has farrowed during the night, and the young pigs are lying around the pen frozen stiff.

During pregnancy sows should be liberally fed, and have plenty of exercise.

In summer, a grass run is very necessary. This, with a liberal allowance of whey, skim-milk and some bran, shorts, or any other kind of meal convenient will be found sufficient In winter a liberal allowance of roots should be given with some bran and whole peas or corn. During cold weather there is a tendency for sows to keep too closely to their beds and for this reason I would advise feeding outside unless the weather is very severe.

A week or ten days before farrowing time the sow should be removed to a pen by herself and fed laxative food, as there is more or less tendency to costiveness at this period; care should be taken to keep the bowels open. After farrowing the sow should be fed sparingly for a few days, and as the pigs grow feed more liberally. At three or four weeks the males should be castrated. Now comes the most critical time in a pig's life, and that is weaning time. Many pigs are utterly ruined and rendered unprofitable, by lack of a little care and attention needed just then. The average pig begins to eat at about four weeks and a part of the pen should be partitioned off for the use of the young pigs. Into this a trough should be placed and the youngsters fed on sweet milk, etc.

A day or two before the pig is taken off the sow should be fed sparingly on dry feed, and continued for a day or two to prevent danger from caked-bag The young pigs after weaning ought to be fed often five or six times a day, but after they grow older three times will answer. The youngsters should be kept growing and as they advance in age stronger feed may be added to their ration. The aim should be to make a pig a pound a day, and at the age of six months you have a pig weighing 180 which is just what the market requires at the present time, and is easily attained with a well bred and fed pig. It ought to be the aim of the farmer to produce a uniform supply through the year. A great change has taken place in the manner of marketing pigs during the last decade. A few years ago they were nearly all slaughtered during the months of November and December, but now with the aid of modern appliances, packers can slaughter and cure at all times of the year. Hence the desirability of raising a uniform supply. I will quote from the bulletin issued by the Ontario Government. In only one of the six years has the average price fallen below $5 per 100 lb., live weight, but the instructive lessons of the table is found in a study of the monthly averages. For the six months, October to March the average price of the six years is $5.36 per 100 lb., live weight, while for the six months, April-September, it is $5.69. Again, for the three months, November, December and January, when most of the hogs are sold by the farmers, the average price of the six years is $4.92, while for the three months, July, August and September, it is $5.78, a difference of price in favor of the summer months of 86 cents per 100 lb., live weight. From this it would follow that the season of most profitable feeding is early summer and that the object should be to get the hogs ready for market in the period of the highest range of prices, say from June to October, but to avoid overstocking the market in summer or winter, a safe course would be to feed with a view to maintain a regular supply throughout the year.

THE CARE OF BROOD MARES.

By J. H. Reed, V. S., O. A. C., Guelph, Ont.

As the usual foaling season is fast approaching, a few words on the care of brood mares may be said with profit. In order to make a successful breeder a farmer requires to have an intelligent knowledge of the best treatment for pregnant mares, and also of caring for the newly born animal.

A pregnant mare should be kept in moderate condition, neither excessively fat nor excessively lean. During pregnacy she should have regular exercise or light work, and be fed on clean, easily digested food, and the supply of water should be plentiful and of the best quality. This is a very important matter. She should not be subjected to excessive or severe exercise to such an extent as to cause fatigue. If she be a road mare I think it good practice to speed her occasionally for short distances, as I consider there can be no doubt that the habits of the dam has more or less of an effect on the inherited traits of the progeny, but she should not be driven fast long distances or sufficiently to cause weariness. It is not good practice to subject a pregnant mare to much saddle work, exercise in harness being much the better. If she be a work mare she should have regular and gentle work, avoiding very heavy loads or work that will require very great physical exertion. Gentle work or exercise of some kind is advisable until almost or quite up to the time of the birth of the young. All frights or nervous excitement should be avoided as much as possible, as such very often has an unfavorable action on the fœtus, and in many cases causes premature birth, and abortion frequently becomes a habit with mares. I think in case of abortion it is not advisable to again breed the mare for a year. When the mare has reached the tenth month of gestation she should be supplied with a good, roomy box stall when not at exercise, as, although eleven months or thereabouts is the usual period of gestation, a mare may foal at any time between ten and thirteen months. Many colts are lost by not attending to this. In many cases, either from ignorance of the date of conception, or from the mare foaling earlier than was expected, the mare foals while tied up in an ordinary stall, the colt often perishing either from being smothered in the membranes or from being trampled on by its dam or other horses, or from other causes that might have been avoided. The box stall should be roomy, perfectly clean and well ventilated. There should be no mangers or feed boxes in such a position that she might drop the foal in one of them. As it frequently happens that a mare foals standing, it is a good practice to feed her hay on the floor and have a portable box in which to feed grain, the box to be removed each time after feeding. When she gives such indications as go to show that she is near foaling she should be carefully watched. Most breeders are familiar with those symptoms: the udder becomes fuller, and often there is an effusion of a viscid liquid from the teats which adheres to their points, somewhat resembling wax; the abdomen becomes more pendulous, and there is a sinking, so to speak, of the muscles of the loins and hips. Often an uneasiness is noticed, and if she be a young mare about to give birth to her first foal there is often an excited, wild look in her eyes. These premonitory symptoms are not always present, but usually some or all of them are more or less well marked. If she be a nervous mare or a *primi pera* (one giving birth to her first foal), it is well for the attendant to be as quiet as possible and keep out of sight if he can, as his presence may increase the nervousness of the mare. The watching in such a case should be entrusted only to a reliable, careful man. Close watching is necessary for the following reasons: 1st, The foal may be born in the membranes, and unless these be immediately ruptured it will perish from suffocation, and although in many cases instinct teaches the dam to rupture them with her teeth, in many cases she does not do so. 2nd, There may be some slight abnormal presentation of the fœtus, that, although it may render it impossible for natural delivery to take place, a careful man may be able to put things right and thereby save the foal. 3rd, The presentation may be so complicated that it will require skilled assistance, and if the attendant be unable to render this assistance he can at once send or go for a man who can and thereby save at least the life of the dam if not the offspring, while a few hours' delay may prove fatal to both. 4th, In many cases the foal is born with the umbilical cord (navel string) intact, and this requires attention. This should be firmly tied with a

strong but soft string, about an inch from the belly, and cut off about an inch below the string. If cut off without tying there is apt to be too much, and sometimes fatal, hemorrhage. If the dam will attend properly to the young, that is, lick it off until it is dry, interference on this point is unnecessary, but if she fail to do so the attendant must encourage her to do so by sprinkling the colt with a little flour or salt. If this fail he must rub it dry with cloths or wisps of hay or straw. The licking or rubbing increases the circulation and gets up the animal heat. In about an hour after birth the foal must get some nourishment; the attendant can be of great service here in assisting the colt to suckle. He should see that it does so about every half hour or so for a few times, when, as a rule, all will be well. If the dam be cross and refuses to allow the colt to suckle, usually a twitch twisted tightly on the dam's upper lip will overcome the trouble, but sometimes it will not. I find in such cases a little brandy sprinkled over the colt, and some rubbed on the mare's mouth and nostrils, often has the desired effect. This may appear to some to be a peculiar remedy, but it is worth trying, and I have found it to answer well. Care must be taken to see that the natural external openings of the foal be pervious—that is, the eyes, nostrils, mouth, anus and urethra. Some of these, especially the anus and urethra, are occasionally closed, and an artificial opening is necessary. He should see that the little animal voids the meconium (the first dung), which is of a black color and of a sort of tarry or waxy consistency, and often in such large lumps that spontaneous expulsion is impossible. Many colts are lost from this cause. Avoid, if possible, the giving of any kind of physic. The best method of treatment, unless there be spontaneous expulsion, is to oil the finger and insert it carefully into the anus and remove all that can be reached, being careful to not lacerate the parts; inject a little warm water or oil, and in three or four hours, or less time, again take away all you can with the finger, and again inject. Continue this until the faeces assume a yellowish color, which is an indication that the meconium has all passed, and the milk (or at least the faeces formed by the milk) is passing. When this occurs danger from constipation, or retention of the meconium, will be passed. In rare cases it is necessary to give a laxative, in which cases I would use a little castor oil and raw linseed oil about equal parts, say a dessertspoonful of each for an ordinary sized colt; but, as stated, I would avoid the use of any kind of physic if possible, as they may act too severely and cause death from diarrhœa. The attendant must also see that the urine is voided, and if not he must pass a small catheter, as sometimes the opening is not pervious, and unless it be forced the urine cannot be voided. By attending to these matters, and also to the comfort of the dam for a few days, every thing will be likely to do well. I might again state that great care should be taken as regards cleanliness of the stall and its surroundings. It is good practice to scatter lime on the stall floor occasionally before foaling time, as this has a tendency to kill microbes, some of which when present may enter the umbilical opening of the colt and cause a disease called navel ill or joint ill, which is usually fatal. If the urine should escape in drops from the navel, skilled assistance should at once be procured.

As to the proper time to again breed the mare opinions differ. About the ninth day is the popular time, and many claim it is the surest time. My opinion is that this is too soon, that in most cases the genital organs cannot have assumed their normal condition, and that it would be better to wait for the next period of œstrum. If the dam be required to work she may be put to work in from ten days to two weeks after parturition. I think it better to shut the colt in the stable rather than allow the little thing to follow the dam all day in the fields. But if possible the mare should not be worked; and the colt will do better, and the dam will do better if not worked. If the dam be worked care should be taken to not allow the colt to suckle when the dam be heated, as heated milk is likely to cause diarrhœa, which is often fatal. I should have stated earlier that it is necessary for the colt to receive the first milk of the mother called the "colostrum," as this has a laxative effect. I might also state that if the dam does not void the afterbirth within ten or twelve hours after parturition it should be carefully removed by hand, and if within a few hours or a day or so she suffers from after pains, the symptoms of which resemble those of colic, the colt should be removed from the stall to avoid injury, and the dam get a colic drench, say two ounces each of laudanum and sweet spirits of nitre in a little water. If more serious diseases of the genital organs occur, professional assistance should be secured.

THE CARE AND MANAGEMENT OF A FLOCK OF SHEEP TO MAKE IT PROFITABLE.

By John Jackson, Abingdon, Ont.

We have only to look around us, and note the results in the experience of others, to be convinced that success or failure depends almost entirely on the care and management of a flock of sheep.

Knowledge gained in the school of experience is good, although sometimes rather expensive; but there are now so many ways of getting information in all these lines, that there is no occasion for the ordinary farmer to make expensive experiments; and life is too short to trifle away in this slow school.

With those who commenced breeding sheep some thirty or forty years ago, it was quite different, especially with those who undertook to establish pure bred flocks. We did not have the same fountains of information to draw from that we have to-day. There were but few agricultural papers, and very little in them about the characteristics of the different breeds of sheep, or the care and management of them.

We had no Agricultural College to which to send our sons, where they could obtain a practical knowledge of the different breeds of sheep, and the most improved principles for their care and management. We had no organization of Farmers' Institutes, where we could meet and interchange our views. We did not have a live Sheep Breeders' Association through which the most successful breeders of sheep give their experience and knowledge to the public; and while it might be somewhat confusing to attempt to follow all the paths marked out by successful sheep breeders, yet a close observation of their operations would point out a shorter road to success.

There can be no cast-iron rule laid down. We must be governed more or less by our surroundings and circumstances, whether it is best to raise early or late lambs, to sell in summer or feed in winter and sell later. The time to breed a flock must depend on whether buildings, feed and other things are suitable for early lambs or not.

The first thing we will notice in establishing a flock of sheep, and one of great importance, is to select a good flock of ewes, which should be uniform in character and good size of their kind. The next and by far the more important step to take is to select a suitable sire. This requires the exercise of skill and judgment. It is always best to go to some well established flock, to a breeder who has a reputation such as he cannot afford to lose, and even though the price may seem high, get one even if he be not so large, with strong male characteristics, full of quality, with well developed points, and, as an Englishman would say, "well comed."

The ram when in use should be regularly fed. The best plan is to separate him from the ewes either for the day or the night, and feed morning and evening with a mixed feed of bran, oats, and a little cake.

In the fall when the weather gets cold or the pasture bare, give them access to shelter, and also accustom them to a feed of hay before they are driven from the field by a snow storm; in this way the change from green to dry food is gradual.

Sheep do not require warm, frost-proof buildings, but they should be dry, well bedded with straw, free from draughts, and well ventilated. For pregnant ewes the doorways should be wide to prevent the possibility of injury from crowding; they should have plenty of yard room for exercise, and a constant supply of pure water, to which they may have free access at all times.

For winter food, green cut, well cured clover hay and pea-straw is all that breeding ewes require. They should be fed at a regular time, as near as may be at the same hour each day, and only as much hay as they will eat up clean. In the absence of a sufficient supply of hay sheep will do well on any kind of good straw, with an additional allowance of grain and bran. Young sheep should be fed a small ration of grain and roots through the winter, to keep them growing; this will be partially returned in the increase of wool, both in quantity and quality.

The lambing season is the most critical and requires close attention. If lambs are to come early, the ewes should then have a separate and warmer place, be accustomed to a light feed of grain, for about two weeks before dropping their lambs, after which the allowance of grain should be gradually increased with the addition of roots till they go to pasture. During the lambing season it is well to have at hand a nursing bottle, but if possible get them to nurse on the ewe. This is the most natural way and the lamb will generally do better.

Sheep should be handled in a quiet way. They are a very docile animal when kindly treated. It is a good sign to see sheep inclined to come to the shepherd rather than flee from him. If roughly treated they may be as wild as hares.

Place salt within their reach where they can have free access to it at all times; there is then no danger of them taking too much. Study well their own inclinations, let them have a chance to go out in the fresh air if they choose; give them a bit of their own way. Sheep are more sagacious animals than they get credit for.

Lambs, when they get about four weeks old, should have a place with a "creep" where they can go in by themselves. This must be supplied with some enticing food, such as crushed grain and bran with some pulped roots, which will keep them growing till they get on the pasture.

Dock and wether the lambs at from two to four weeks old. This is a matter that is too often neglected. The shearing should be done either in April before going to grass, or else about the latter part of May. And in either case should be close and evenly done. Ticks should be all cleaned off the ewes in shearing; then by a proper dipping of the lambs the flock will be in a fair way to thrive and go forward.

In the spring when turning the flock to grass, they should only be let out for a part of the day at first and fed inside as usual, so as to make the change gradual.

The care of the flock in summer is comparatively light; generally through May and June pasture is abundant, and this is all that will be required—but often it becomes dry and scarce in July and August. Sheep, like horses, can bite close—in fact, so close that it may take a good while in the fall to again get a start, except in favorable seasons To provide against this, vetches should be sown in early spring and some a little later, followed with a plot of corn, and a good piece of rape. All these make the best of food for sheep. The vetches will be fit to cut about the first of July, and we believe the best way to feed would be somewhat after the fashion of the English flockmaster. Provide hurdles, the cost of which would not exceed seventy-five cents per rod, letting the sheep in the fold in the evening, and out in some shady plot supplied with water during the heat of the day. The vetches should be cut forward of the fold, and fed in moveable racks In this way there would be no waste, and the land would be evenly manured all over. A separate fold should be made for the lambs, with a "creep" to allow them to separate from the flock, where they could be fed a little grain, to push them forward more rapidly, either for the butcher or the show ring. This land when fed off would make an excellent preparation for wheat, or it might be sown with turnips or rape to be again fed off in the fall. When the vetches are done, the corn, of which the sheep are very fond, would be ready. This could be fed inside or out. We think the best results would be obtained by taking in a week's supply at a time, and by running it through the cutting box it could be fed inside without waste Corn should be grown thin to ensure strong juicy stalks, and I know of no better food for sheep I need not tell you what a large quantity can be grown on an acre of suitable land when well manured. There is nothing grown in England to at all compare with our crops of fodder corn. Rape sown among the oats in the spring will give a cheap lot of good feed after the crop is taken off.

About the first of July or August, according to age, the lambs should be weaned. For some days before and after weaning the ewes should be on rather dry feed. The lambs can then be pushed forward according to the purpose for which they are intended; and if used to being fed in the fold by themselves will without fret or worry forget their dams and take kindly to their feed.

This is the time to go in the flock with the paint stick, and cull out all "old crones" and any that have not bred satisfactorily. Put them by themselves or with the lambs

to be put in shape for the market. It is also the proper time to select such as are to be kept on the farm. The balance, to be disposed of either to the butcher or breeder, should be kept by themselves in a separate lot. If the stock for sale are separate from the others you can give a customer his choice. This is always pleasing and enticing to a customer; in fact, the culls will look better when by themselves than if mixed in with better sheep. A little time spent on these with the shears to put them in a tidy presentable shape, will be time well spent. Too little attention is paid to this important part of sheep-husbandry. The sheep, after scrubbing against fences, bushes or briers all summer, will not appear to the best advantage, and will not pass for what they are really worth. This applies to all breeds, but more especially to the Down breeds and their crosses. An even surface helps to keep the wool clean. In stormy weather it prevents snow from freezing to the sheep; this alone will pay for all the trouble.

The breeding ewes require no extra care or food during the fall months if they have moderately good pasture. Frequent changes from one field to another is always good for sheep.

The work of caring for and managing a flock of sheep is comparatively light, clean and pleasant, and can be done by the old, the young, male or female. We are told in Holy Writ that "Rachel kept her father's sheep." And at the present day there are several of the fair sex who have celebrated flocks of sheep. No one need be ashamed to own or care for a flock of sheep, if they are only good and well cared for.

It has been said of sheep that they are the most valuable of all the animals that contribute to the wants of man, and are closely associated with his history, vicissitudes and progress from the earliest time. The origin of sheep is unknown; it may be traced back through vast ages, into the mist of time's dark obscurity, and probably before the advent of the human race upon earth, for we find it associated with the son of the first created man. "Abel was a keeper of sheep." "Search the Scripture," and how closely we find it associated with the material and spiritual welfare of mankind, adopted as a symbol of purity in Christian belief, an emblem of patience, docility and forbearance.

A careful observer who would calmly survey the vast world of animated nature, spreading from pole to pole, would note the teeming millions of sheep, which contribute so much to the wants and comforts of mankind. The thoughtful mind wanders from the scene around him, when contemplating this useful animal, how it has been developed and adapted to conditions opposite and extreme; be it upon the high, bare, desolate mountains, or the scorched plains of Africa, sheep are found suitable to the conditions of the soil, climate, and man's requirements.

Modern civilization has not rendered sheep less important now than they were at earlier periods. They form the most essential of all food, and their wool is one of the most important materials connected with the trading, manufacturing, and pastoral industries of mankind.

The sheep has stood with the pioneer of this country in clearing up new lands, ridding them of briers and bushes, earning in this way his living, and each year paying his keeper a profit in wool. He has been the helper of the more advanced farmer in keeping up the fertility of his soil, and to-day on the best improved lands, where the log-cabin has given place to the more comfortable farm house or the stately mansion, the sheep still holds his right on the handsome lawn or on the rich pastures of his well to do owner. This is especially true of the finer mutton breeds of sheep.

THE MANAGEMENT OF AN ORCHARD.

By H. L. Hutt, O. A. C., Guelph, Ont.

In dealing with this subject we will suppose that the orchard is planted on good, well-drained land, that varieties suitable to the locality have been selected, that the trees are straight and vigorous, and that they are all in perfectly straight rows. Crooked trees and

crooked rows in an orchard are not only unsightly, but a constant source of annoyance. They not only endanger the lives of the trees, but the morals of the man who has to cultivate them.

With an orchard, then, composed of good trees, well planted on suitable soil, let us consider briefly a few of the most important points to be observed in its management.

It matters little whether it be an orchard of apple trees, peach trees, pear trees, plum trees, or even a vineyard, for in many respects they require the same attention.

Cultivation. One of the first requisites to success in the management of any orchard is thorough cultivation. Without this it is a waste of time and money to plant an orchard. By good cultivation I do not mean plowing under weeds every time they appear, but rather cultivating often enough to keep them down and keep the surface soil loose and open without plowing at all.

Cultivating two or three inches of the surface soil is much better than plowing twice as deep, as there is not so much danger of cutting off the small fibrous roots which feed near the surface; and instead of turning up with the plow five or six inches of the soil, leaving it in large lumps which dry up, the cultivator leaves two or three inches of mellow surface soil, which acts as a mulch retaining the soil moisture below. Besides being better for the trees, shallow cultivation is cheaper and can be more frequently given. In caring for an orchard the aim should be to avoid as far as possible the necessity for plowing by giving frequent cultivation. Start the cultivator in the spring just as soon as the land is dry enough to work. Then when weeds appear, or the land becomes beaten down with a heavy rain get at it again before a crust forms, and keep the surface mellow and open.

In a young orchard some hoe crop may be grown between the trees, which will yield a good return from the land till the trees themselves begin to bear. But it must be remembered that the roots of a tree generally spread as wide below ground as the branches spread above it, and as the roots should be the sole occupants of the ground as far as they extend, nothing should be grown under the head of a tree. All crops grown between the rows should gradually give way as the trees increase in size. Never grow a grain crop in a young orchard unless a space at least as wide as the height of the trees is left on both sides of the rows for clean cultivation.

Whether or not sod should be allowed in an orchard is a disputed question. All good orchardists are agreed, however, that it should not be allowed in a young orchard of any kind, nor in a peach or plum orchard of any age. There is no doubt about it that sod is one of the main causes of so much inferior fruit, or no fruit at all in many orchards. The evil effects of sod in an orchard are generally indicated by the diminished vigor of growth, the small and yellow appearance of the foliage, the abundance of insects and the scarcity of fruit. With extra manuring and special care trees may sometimes be made to do fairly well in sod, and of course if trees in sod are doing all that might be expected of them both as to quality and quantity of fruit, then it would be useless to cultivate, but this is rarely found.

It may be put down as a general rule that orchards require clean cultivation, and the chief exceptions to that rule are pear orchards, where the trees are liable to blight, or orchards in which the trees are growing too vigorously and where the tendency is to grow wood rather than fruit. In such an orchard, by seeding down for a couple of years, this too vigorous growth would be checked and the trees probably brought into bearing. Orchards in which the growth is too vigorous are, however, rather scarce; too often the trouble is that the growth is not vigorous enough.

Manuring. Good cultivation is the most economical substitute for manure, but it will never altogether take the place of it. We never think of getting a crop of corn year after year on the same ground simply by cultivating without manure, yet some men seem to expect a crop off their fruit trees year after year without manure, and often without cultivation either.

Trees, in making their growth, take a certain amount of fertility from the soil; and unless, after they have made their growth, there is fertility enough left to make a crop of

fruit, we need not expect it. "Take something from nothing, you can't," applies to the taking of crops from the soil as well as to the taking of one number from another on a slate.

If we expect our fruit trees to feed us we must feed them, and anyone acquainted with the habits of trees can easily tell when they are hungry. When trees do not make a good annual growth a foot or so in length, and when the leaves are small and turn yellow early in the fall, they say very plainly they are starving, and do not bear because they are not able to. As with hungry hogs, so with hungry trees—feed them. And a hungry fruit tree is by no means "snoopy." It will take barnyard manure, wood ashes, ground bones and almost anything in the shape of manure, and show by its behaviour that it is glad to get it. But if there is one thing more than another that a fruit tree has a relish for it is wood ashes. Unleached wood ashes contain all the elements which trees in growing take from the soil; hence they are specially adapted to fruit trees, vines and bushes. They are to fruit trees what oats are to a horse or oatmeal to a Scotchman.

It is a poor policy some farmers have of trading off their wood ashes for a few bars of soap, when by giving them to their fruit trees they might get in exchange for them fruit worth ten times the value of the soap.

Wood ashes may be safely applied at any time, as they tend more to the production of fruit than wood, but barnyard manure should be withheld where there is too great a tendency to wood growth.

In applying manure to a tree do not put it right around the trunk of the tree, but spread it evenly over the surface as far out as the branches extend. It is the small, delicate roots or root hairs farthest from the trunk that take up the plant food from the soil. Manuring an old tree by putting the manure about the trunk is about as sensible as feeding a horse by putting the oats around his hind legs. As the horse's mouth is at the other end of the animal, so the tree's mouth is at the other end of the roots.

Pruning. Regular pruning is an important factor in the successful management of an orchard. One of the first things to be considered in pruning an orchard is the height at which the heads should be started. Some prefer low heads and others high heads. Either extreme, I think, should be avoided. For apple trees start the head about 5 feet, for plums and pears about 4 feet, and for peaches probably about 3 feet or a little less. Train the lower branches upward, so that they will interfere as little as possible with cultivation. Young trees may be sufficiently pruned during the summer by rubbing off all superfluous shoots as they appear. The ideal pruning consists rather in directing growth than in cutting out what has grown. Cutting branches out of a tree is simply chastising it for doing what it should not have done. As some parents may train up a child in the way he should go with very little punishing, so some fruit-growers may train up a tree in the way it should go with very little pruning. But this requires careful watching and directing. Then as there is a danger of sparing the rod and spoiling the child, so there is a danger of sparing the knife and spoiling the tree. An orchard should be pruned regularly every year, for if the trees are to be trained up in the right way they must be checked when they go astray before they become hardened in their sins.

Probably the best time for pruning an orchard, and generally the most convenient time, is in March or April, when severe frosts are over and before growth has commenced.

In most kinds of trees all the pruning necessary is to thin out the branches when the head is too crowded, so as to admit plenty of air and sunlight. This is necessary to produce well-colored fruit. Cut out any limbs that cross or rub each other, and cut back shoots growing too fast in any particular direction, as they sometimes do on the leeward side of the tree, thus keeping the heads symmetrical.

Much can be done towards directing the new growth by cutting back to certain buds. Thus to train the lower branches of a tree upward always cut back to a bud on the upper side of the branch; or in pear trees, where the tendency is to grow close and upright, spread the new growth by cutting back to buds on the outside of the branches.

If at any time a large limb has to be cut out, the wound should be covered over with a daub of paint to prevent decay, but if trees are pruned regularly and properly there will seldom be any necessity for cutting out large limbs.

The stone fruits differ very much in the amount of pruning required. The cherry requires very little pruning, while the peach is benefited by a rather severe pruning. In the peach tree the small branches in the centre of the tree naturally die out, leaving, as the tree becomes older, long bare limbs, with the new wood all at the extremities; and as this is the wood that bears the fruit, such trees when loaded have to be propped up to prevent the limbs breaking and splitting down. Now this may all be prevented by practicing what is known as the "shortening in" method of pruning. That is, every spring the new wood is cut back about one-half. This causes the trees to grow compact and symmetrical and keeps the centre full of new bearing wood.

In some of the large orchards in New York State they practice this method of pruning on plum trees as well as on peach trees. But as the inner branches of a plum tree do not naturally die out as they do in a peach tree there is much less necessity for this "shortening in" pruning in the case of plum trees.

Spraying. In an orchard well cultivated, liberally manured, regularly pruned and of a bearing age one might expect good crops of fruit, but now-a-days one thing more is needful: We must fight insects and fungous diseases.

The spraying pump is the fruit-grower's most effective weapon of warfare. Paris green and Bordeaux mixture are the cheapest ammunition. To prevent the apple scab and many other fungous diseases spray with the Bordeaux mixture, once before the blossoms appear, then again as soon as they fall, and two or three times afterwards at intervals of eight or ten days. The Bordeaux mixture may be made according to the following formula:

Copper sulphate	6 lbs.
Quick lime	4 lbs.
Water	40 galls.

To check the codling moth, curculio and many other such insects, spray with Paris green in the same way after the blossoms fall, using 1 lb. Paris green to 250 galls. water, or 2½ ounces to a barrel holding 40 gallons.

There are many ways of fighting these little enemies, and some of the best methods are preventive. Clean cultivation goes a long way towards keeping down insects by preventing their breeding in the soil, and if in addition to this hogs are allowed to run in an orchard they will pick up most of the fallen and wormy fruit, and do themselves and us a good turn by converting into pork many a codling moth and curculio. For black knot in plums and cherries, and blight in pears, apples and quinces the only effective remedy is to cut out and burn the affected parts whenever they appear. In removing these cut several inches below where the diseased portion is seen.

Thinning. With good attention all along these lines I have indicated, we may then reasonably expect a crop of fruit; but in our desire for a big crop we should never allow the trees to over-bear. When trees are loaded with fruit it sometimes goes against the grain to pull off nearly half of it when it is small, but those who practice thinning testify that it pays better than allowing the trees to overbear.

Next to good cultivation nothing tends more to develop the size and handsome appearance of a fruit than judicious thinning when the fruit is small. In this way we may so increase the size that with half of the crop thinned out when small the remaining half when full grown will fill just as many baskets or barrels as if the whole had been left, and the improved size and appearance of the fruit will make it worth nearly twice as much money. It is by thinning that many of the fine specimens seen at exhibitions are obtained.

Over-bearing not only injures the quality of the fruit but the vitality of the tree. It is over bearing that causes some trees to bear only every other year, or sometimes bear for two or three years and then give out. Some horses will go so far in one day that they cannot be got back in a week. It is just the same with some fruit trees. Do not allow them to exhaust themselves so in one year that they require two or three to recover.

It is the production of seeds rather than the pulp or flesh of the fruit that more particularly draws upon the energies of the tree and exhausts the soil. By thinning we increase the size of the pulp and at the same time diminish the number of the seeds.

Here, then, we have a clue to the proper time to thin. Commence early, before the tree has wasted any of its energies in the production of seeds, or just as soon as the fruit is sufficiently formed that we may judge of its character. Then thin out all small, defective and wormy specimens, and as much more as may be thought advisable. In large trees this may look like a formidable task, but by the aid of a little hook on a light pole it may be done rapidly even in large trees, and in small trees it is a very simple operation.

To summarize briefly: to be successful in the management of an orchard we must:

1. Cultivate thoroughly.
2. Manure liberally.
3. Prune regularly.
4. Spray frequently.

Then when we get a big crop,

5. Thin judiciously.

TOWNSHIP INSURANCES.

By Wm. Simpson, Ridgetown, Ont.

When your Secretary-Treasurer at our last annual meeting in Thamesville asked for papers on three or four subjects, one of them on fire insurance, I volunteered to give you a short one. I then said it would be almost unnecessary as there was already one established in the township in connection with the Howard Farmers' Mutual Fire Insurance Company. But as there are some of the farmers from the townships north of here it might be of some use to them to make a statement regarding township insurance methods, and it gives me great pleasure to do so, as I, with others, have been particularly active in the interest of a farmers' company during the last two years.

The cost of fire insurance is a matter that has agitated the minds of the farming community for the last twenty years; and although it has been talked and discussed in this western part of the country for years there was really no definite steps taken until about four years ago when the Essex and Kent Insurance Company was organized, and as the management was situated principally in the County of Essex, except in one or two townships, very little of it was known in this county (Kent); but for all that east and north of us the farmers were well organized in respect to fire insurance, and it may surprise some of you to know that there are at present fifty-four chartered farmers' companies in Ontario all working well and satisfactorily.

I think the best thing I can do is to give a short history of the Howard Farmers' Mutual Fire Insurance Company, in which I have said I have taken an active part

About two years ago, I think in November, 1891, there was a meeting held in Botany schoolhouse to see what we could do to get a farmers' company organized in the Township of Howard. We went to work according to "The Ontario Insurance Act of 1887" and got successfully organized, and commenced writing business on the 4th of April, 1892, and in May, 1893, the Townships of Orford and Harwich were added. We have now 478 policies issued, amounting to $586,000 in risks. Our loss up to now has only been $295.77. Our expenses all told last year were $165.10, which included organizing expenses and necessary books and salary. Our expenses for 1893 will be about the same, which will leave us a surplus of $900 or over. Our assets are over $16,000.

Once you are assured of a company's soundness the next question to consider is the cost of insurance, and to men who have their buildings insured for thirty or forty or even fifty years the question of cost is no trifling one. The cost of insurance runs all the way from $2 per $1,000 of risk per annum to $3 and in some cases even more. Now, the report of the Ontario Insurance Inspector shows that the local farmers' companies are, as a whole, doing a safe business, while at the same time they are carrying the risks at as low a rate as possible consistent with safety to the patrons of these societies. This may be accounted for on the ground that these companies are not run for the benefit of a greedy, grasping lot of shareholders whose desires are only bounded by what they can grasp from a long suffering public, but are managed at as small an expense as possible in the interests of the insured.

CLOVER GROWING AND CURING.

By W. S. Fraser, Bradford.

Who does not know the three-leaved plant so common in our fields and lawns known as clover? How often in our early days have we searched for an anomaly of its development and rejoiced if we found a four-leaved plant? How we prized it and looked upon it as a talisman and felt that for that day at least we might expect unusual good luck.

But as our childish days have passed away and we have put away with them childish notions, yet we farmers are interested still in this same plant, although we may not care now whether its leaves number three or four. Our success as farmers depends very much on how it flourishes on our farms and the use we make of it.

There are many different kinds of clover, but the varieties usually sown are alsike, lucerne and small red.

Alsike is mostly grown for seed. It has good feeding qualities, in early summer as pasture, and when cut for hay. It is a surface feeder and does not rank high as a land improver.

Lucerne is a large, strong, deep rooted kind, especially useful for soiling purposes, and may be cut as often as four times in a season and will continue for years in the ground.

Small Red is the kind that is mostly sown. Of this kind I purpose saying a few things which to many may seem very commonplace, yet perhaps thereby some may be induced to look upon this little plant with deeper interest. It is classed among the biennials, yet it is subject to variations. Under favorable conditions it will produce seed the first year and sometimes continue to bear seed until the third year; yet these variations are the exceptions, not the rule. But we often see men who after having grown a good crop of clover wonder how it is that the next year the plants are all dead.

Clover may be sown with spring grain, spring wheat and barley giving the best results. Oats in a dry season are apt to sap the moisture from the ground to such an extent that the young plants are rendered weak, if not completely killed. Peas, especially long vined varieties, will smother out the young plants in spots. It may also be sown on fall wheat early in spring while the snow is yet on the ground or when the ground is frozen or as late as the first of May. When sown late the land should be harrowed. It is usually better to mix a little timothy seed with the clover—say one pound of timothy to nine of clover—sowing ten pounds to the acre. If the ground is in proper tilth there is not much danger but there will be a good catch. It is better not to pasture the young clover after harvest unless it is very luxuriant and then only in moderation. The stubble serves as a protection in winter by retaining the snow; if heavy, it may be removed in spring by means of a sulky rake.

If a crop of seed is desired, the clover may be pastured until about the 20th of June. If the first crop is saved for hay, it should be cut not later than the 25th June. Gypsum sown on the land in spring, will give a marked increase, in both the hay and seed.

Clover should be cut as soon as about one third of the heads have begun to turn brown. If a tedder be used it should follow the mower, in a couple of hours. If the hay be very heavy and there is no immediate danger of rain, the hay may be allowed to lie over night, but next day it should be put in cocks, making them as high and narrow as will stand well. It may be left in cocks for a couple of days. On a favorable day it may be turned out to the sun, and after an hour or two exposure to the air and sun it may be drawn to the barn, where it should be firmly packed in the mow, using a horse to do the tramping. The greenest bundles should be put in centre of mow. Clover hay should in winter, be fresh and green, with blossoms almost the same color as when cut.

When we save clover in this way, we have a nutritious food which is relished by any animal on the farm, hogs not excepted. Such hay will do much to remove the prejudice against feeding clover hay to horses.

When we find so many farmers who do not cut their clover until it is nearly ripe and let it lie a couple of days, under a scorching sun, until the stalks are all broken, the leaves fallen off, the blossoms almost in dust, we do not wonder that so many think that

clover hay is not fit food save for sheep and barn yard cattle. Clover should not be left more than one season. We get the best crop the first year, and if plowed in the fall, we get the best results from the stored nitrogen in the roots; any crop will do well following clover.

Clover will do well on almost any land, but better where there is a good subsoil. It is the best land renovator we have. It is the poor farmer's best friend. Not only is it good for hay, but for pasture—both in the hot summer and in the autumn—we have no plant that will equal it.

Its broad leaves shade the ground and draw largely on the nitrogen of the atmosphere; as a green manure, it has no superior. Its long tap-roots serve to open up the subsoil, thus allowing air and water to enter more readily. In this it is only equalled by angle-worms.

Clover also helps the farmer, to rid his land of weeds. The first crop is generally so luxuriant that they do not make much headway, and it is cut at a time when it hurts all weeds very much, and entirely destroys some. The ground may be plowed after cutting the first crop and with surface cultivation will make a good seed bed for fall wheat.

SALT ON THE FARM.

By A. E. Shuttleworth, O. A. C., Guelph.

The action of salt on land is a subject of discussion at nearly every farmers' institute meeting. Does salt improve land; is it a fertilizer or a stimulant; on what crops should it be sown? These are a few of the many questions as to the use of salt. Owing to these numerous enquiries, coming chiefly from farmers, I have decided to write upon this subject.

Composition.

Pure salt is composed of only two simple substances, sodium and chlorine, 39.4 per cent. of the former and 60.6 per cent. of the latter. But common salt, purchased as dairy, barrelled, and land salt, contains small quantities of other substances called impurities. Calcium sulphate or gypsum, calcium chloride, and magnesium chloride are substances always found among these impurities. About 92 to 97 per cent. of land, dairy, and barrelled salt is composed of sodium chloride. Neither of the elements of sodium chloride are essential to plant growth, and therefore pure salt is not a direct food to plants. Among the impurities in common salt are substances essential to plant growth and therefore of manurial value. One impurity, gypsum, contains lime and sulphur; others, calcium and magnesium chlorides, contain respectively calcium and magnesium, both essential to plants. Therefore 92 to 97 per cent. of the total weight of salt has no direct manurial value, but a small percentage, 1.5 to 6.5 may have.

Salt on the Land.

It is only by an actual experiment that it can be determined whether or not salt will be a benefit on the land. One farmer may apply it to considerable advantage but another to no advantage at all. It may improve a crop, say barley, in one field but have no effect upon the same crop in another field on the same farm. The explanation rests chiefly in the condition of soil. These conditions are even more variable than soils. There are certain crops with which salt, if sown on land, is usually applied. These are the cereals, turnips and mangels. No one, probably, would think of sowing salt on leguminous crops or meadows. Farmers practising—or, more correctly, favoring—its application, contend that it stiffens and brightens the straw, produces a plumper and brighter sample of grain, attracts atmospheric moisture, etc. All these opinions appear to be and are most likely perfectly correct. In what way does salt bring about these results? Atmospheric and remaining soil conditions being the same and right, any influence increasing

unproportionately the nitrogenous matter of available plant food tends to encourage luxuriance of growth, delay maturity, predispose to rust, and produce straw and leaf growth rather than grain. On the other hand an unproportional increase in the amount of ash matter in available plant food has the opposite effect—that is, to decrease luxuriance, promote maturity, shorten and stiffen straw, and produce grain. Salt acting chemically in soil liberates or renders available ash or mineral matter, which increase decreases relatively the nitrogenous matter, the effect being, as above stated, to decrease luxuriance, stiffen straw, promote maturity, etc. Land rich in humus, as broken up meadows and pastures or alluvial soil, may grow a much better crop of barley or wheat with the application of salt than without it. Good clay soil, well drained and worked, will usually contain enough organic matter and plenty of available mineral matter. Such soils will probably produce as good barley and wheat without salt as with it. Loam and sandy loam, cropped many years, are not likely to contain an excess of available mineral plant food. The good effects of salt applied to such soils may be very marked. Farmers upon light soil have received good results for a few years from the use of salt and afterwards, the salt failing in its effects, discontinue its use. Its action appears to be chiefly chemically, acting probably first upon the calcium carbonate in the soil with the formation of sodium carbonate, and finally the liberation of potash and other bases.

The power of absorbing moisture has been attributed to salt. This property is due to magnesium and calcium chlorides, two impurities contained in common salt, and it is most apparent in damp weather in salt stored in barns or sheds. This moisture drawing power may be of considerable benefit to crops growing upon light soils.

It has been been said that pure salt is not a direct manure. But some of the impurities in common salt are direct manures. Calcium sulphate—gypsum—for instance, is always present and may amount to from 2.5 to 3.5 per cent. The action of gypsum is twofold—manurial in a direct sense and chemical in its effect upon other substances in the soil The proper employment of salt on land depends then not so much upon kind of soil as condition of soil.

It being determined by experiment where salt can be sown to advantage, apply with the right crops at the right time and not too much. Over 300 lb. per acre is too much under any circumstances. With wheat or barley or upon mangels as much as 300 lb. to the acre may be sown. But to sow salt year after year upon the same land would be injurious to its condition. One hundred lb. each of salt, gypsum and superphosphate per acre makes an excellent mixture for turnip land, to be applied in addition to farmyard manure. With grain crops sow broadcast after the grain is up an inch or two, but on turnip land sow the same way but just before ridging up.

Feeding Salt to Animals.

It is only the sodium chloride of common salt that benefits an animal. The impurities here have no value. The constituents, sodium and chlorine, though not essential to plant composition, are essential to animals. It is just as essential that animals have salt as nitrogenous matter. Without either one animals cannot exist long. Though not an essential substance in vegetable matter, all plants contain more or less salt. The quantity contained, however, is not sufficient for the animal's requirements; an additional quantity should be supplied in the food.

It is a very common practice among farmers to salt their animals once every week or two. This is not the best way to salt animals. Salted in this way they consume three or four times the quantity that should be taken any one day. This excessive amount has a bad effect upon animal nutrition. In a few days, the animals, not being able to store up a supply in the system, are insufficiently supplied.

Animals should have free access to salt. The elements of salt are essential constituents in certain of the digestive fluids. In the gastric juice, for instance, the digestive fluid of the fourth stomach of ruminants corresponding to the single stomach of non-ruminants, chlorine is essential. Without it the fluid would lose its digestive power, impairing digestion. Independently of imparting flavor salt thus aids digestion.

Probably the greatest objection to irregular salting is the excessive amount eaten at one time when fed in this way. It has several objectionable sequels. One is the increased urinary secretion, causing thirst and excessive drinking. This increased urinary secretion is accompanied by an increased destruction of nitrogenous tissue in the animal system, which means a decrease in animal weight and a waste of food. Irregular salting has other bad effects; and to practice it means, at least, a degree of derangement of the digestive system, loss of flesh and feed. A supply should be kept in a little box or manger where the animals can take a lick whenever they desire. They themselves are best able to judge of the quantity required each day.

PLOWING.

By W. D. Misener, Port Robinson, Ont.

You may think it a queer time of the year to talk about plowing, but as it is often done in the winter time, I do not know as I am much out of place. To begin with, there are few farmers who know really how to do good plowing, myself included perhaps; but I will endeavor to tell you how to do it properly. Good plowing is something like good penmanship, you might study and learn all the different lines and rules of how to do it, but yet not be able to carry into effect the principles taught, as these require adaptation. For instance, unless you have a clear eye and can measure distance correctly, you cannot guide the plow and cut your furrows evenly, and at the same time gauge your land in order to make a proper finish. So with good penmanship; unless you can gauge distance and have a steady hand you cannot ever expect to be very efficient in that line. You may study and learn all possible about the business of farming, but unless you can guide the plow you are deficient in one of the most practical workings of the occupation. You have all perhaps heard the old argument that you can grow more grain on a crooked furrow than you can on a straight one. But that is all nonsense when you take a business view of it. For example: take two farmers with land adjoining; let the one plow in a haphazard way, crooked, up and down and in and out, and finish with two or three wedges and all sorts of uneven furrows; let the other do his work properly, plowing evenly and straight, and gauging his furrows to suit the lay of the land, and in a few years it will take but little to judge as to the most profitable. Why, plowing is a art when properly done. How many farmers are there in this room who take the pains to measure their lands and strike out by stakes—more do it by *mistakes* than otherwise. There is nothing that will add more to the value and appearance of a farm than the laying of it out in proper shape by the lay of the land, etc I mean by so little expense. I do not mean to compare plowing with improvements by way of buildings, as they cost money. It is a fact a great many farmers have an idea that when a field is struck out that it is the way it must remain for all time, whether it is the best or not. Now, how are we going to improve our work? There is one great remedy—take more pains with your work. To be a practical plowman you must be acquainted with the different kinds of soil, as sometimes the soil changes several times in crossing a field, and the plowman must be able at a glance to know whether such soil should be turned on top, or whether it would not be better to leave it below the surface. True, it depends upon the time of year in which the work is done. Soil that would be a detriment to a crop if turned in the spring, if plowed in the fall would perhaps do no harm. We all want a good deep soil as soon as possible. Therefore the proper time to do deep plowing is the fall of the year, in order to allow the action of the frost to mellow and mix the mould for the seed bed in the spring. For the information of those who have never had the pleasure of attending a plowing match and seeing how plowing can be reduced to a science, I might say that in order to do the work properly there are cast-iron rules that must be followed out to the letter.

If a slight mistake is made in striking, even, although as straight as a line; if even if what is termed the scratch should be one inch too wide or too narrow, your back will either be too stiff to fallow or else will fall together, a defect that cannot be very well

remedied. There is one point that a great many fail in in plowing, and that is getting their back too high, and not being able to follow it up. That is what makes those hollow sides in the lands. To remedy that defect be very careful in starting. Always keep your eyes on the strip next the plowed ground, and if not even in width, by a little careful guiding of your plow quite a wedge can be got along with without showing much after the land is finished; but better no wedge at all. In order to make a good finish, in throwing your last land furrow plow as shallow as possible only allowing the sole of the plow to go deep enough to hold the plow strong enough to turn it. If you do otherwise you will finish with a canal, for your sole furrow will drop in the place you took the last land furrow from instead of laying as it should half way up on the last land furrow. One great point in plowing is to have your furrows to read from one end to the other—that is so as the eye can follow without a skip from end to end. Lastly, whenever convenient at all, attend plowing matches; and, more than that, try your hand at it yourself. Even if you do not get a premium, it will be a lasting benefit. In the township of Crowland we had a plowing association of our own It lasted for three years, and no one can deny that its benefits can be seen yet. We got the boys interested, and will perhaps some day get them at it again. All that is wanting is a slight effort.

We must calculate whether our plows are the proper kind for the soil we have to contend with, but if you have a plow that begins to pack the furrow from the time it starts to cut it until it leaves it in its place you better get a good plow at once. There are plows that do not do that, and you gain a great deal of time in harrowing that would be otherwise lost. I am not a plow agent, and therefore I will not advance the interests of any one kind of plow—suffice it to say I think I have one of the best, as my land will be just as fine with less harrowing than if I had some of the other kinds of plows used. But all plows have their defects and mine has one, it will make too wide a finish in spite of everything.

AIR CASTLES.

By Miss Nellie Randall, Stony Creek, Ont.

The power of rearing air castles is one of God's greatest gifts to man. It supplies him with a resource and a relief in the days of adversity, when the winds blow chilly, as well as with pleasure in those brighter seasons. It is a gift universal, denied to none; as free to the young as to the old, but perhaps exercised in a greater measure by the young, whose minds are more active and who have the wider space and the fuller time before them. As for old age, it inclines to wander away back, among the temples of the past and to muse on the bright recollections of by-gone days rather than to build strange, fresh structures. We depend on the young for the development of thought and the advance of civilization for the future of our country. Then does it not demand that a circulation of good literature, and a higher standard of thought-building be given a free access to. It is strange to see how swiftly our castles in the air are called into existence. How rapidly they take to themselves a certain form, good or bad, depends on the builder. A tone of the voice, a glance of the eye or a touch of the hand is enough with some of us to set the imagination to work. The dropping of an apple, or the dancing lid of a tea kettle was a sufficient means to give an impetus to practical action in the case of such men as Newton and Watt after such musing meditation. Imagine the sweet sessions of silent thought of Shakespeare or the faery dreams of Spenser:

"As the imagination bodies forth
The forms of things unseen,
The poet's fancy turns them into shapes,
And gives to airy nothings
A local habitation and a name."

When once the imagination begins 'tis no easy matter to restrain its activity. The boy takes up the romance of Robinson Crusoe, and quickly upon his mind come pictures of far off islands, or fleets of canoes crowded with dusky warriors. Or the girl may, after

carefully reading some fictitious tale, be carried in mind to an ideal and future home. So it is with all of us. Thus rapidly do we build up our air castles, and lose ourselves in the luminous space of an ideal world. What comes of it all? we ask. Well, out of these fancies and airy thoughts have come all that is best in our human effort. The reforms of the statesmen and the systems of the philosophers are at first air castles, and seem as if they would never become realities. Dreams of a better humanity, of a social reform of a near future, when prohibition will waft its sweet perfume from shore to shore, may some day undergo an actual development.

It is the loftier minds that build the most, the purest, and the grandest of these structures which seem so unsubstantial, but which have an element of permanency in them which may out-live their builder.

Prisons, work-houses and gaols are necessary evils, and I suppose they will long continue to be so, but we want a good many strong wills, and castles in the air to which we may turn to relieve the aching heart when weary with such sad spectacles. It may be better for us, we have such disheartening things to face. Were it not so, we, none of us, would strain our influence for a better state. Well it is for us we can turn from dark places in reality to pleasant and bright fancies and golden palaces of thought It reminds us of our capability of better and purer things, of the immortality of our essence.

So it is in every phase of life. Not only do philosophers and statesmen have a chance, but who has a better chance than the farmer in his work, to plan and construct.

Sometimes our plans turn out to be pitiful delusions. Just as was the case of the milk maid who poised a full pail of milk on her head, which when dashed to the earth, dashed with it her prospective gain of butter-money, ducklings, eggs, chickens and all. What a delusion! After so much deliberate planning she counted her chickens before they were hatched, much to her sorrow. However, her experience was a good master. The farmer in his work builds lots of castles. He has more time for thought, I believe, than the man in the city, and it is not strange to me, that our greatest, grandest men, have been country boys. No crowded city crushes out their life of thinking. Plenty of bread and butter, and pure fresh air foster gems of thought and ideas of invention which do not end in mere air castles. The farmer has vast opportunities to bring his highest powers into play, and he does, even if he is called a "hayseed" sometimes, but not more than the farmer's wife or daughter. She is a paragon as far as the professions of women are concerned. Distance from shops or stores often makes articles perform a use before unknown. Yes, she is a very learned woman, whether she knows anything of French and the sciences or otherwise. She is oftentimes inventor, artist, milliner, cook, dress-maker and what not, done up in one earthly tabernacle, and she must compare favorably with an ordinary city woman for practical knowledge, economy and thought. She has to plan, not necessarily from a restricted purse, but for opportunity's sake. Probably we can never make as good an appearance as do the city breds; perhaps a secret to their good appearance is much consultation with the mirror and much "trying on." Money expended on an article does not always make the article meet the requirements. I am convinced that with a little practice almost any of us might make for ourselves more becoming hats and bonnets than those abominations that the oily tongued milliner so easily cajoles us into buying. The object is to make a little go a long way. This is where the city breds have the advantage. They usually, as a class, have the little, whereas the cousins from Willoughby Pasture have the more. Wait in a carriage in a city street where shoppers are thronging and you will see Mrs. Citybred clad in cloth gown and close bonnet, while our cousins try to be fine with draperies, plush bands, silk panels, big hats, yellow feathers and pink neck ruches, all too fussy, too showy, too be-feathered and too be-bowed for their pretty faces. Notwithstanding our appearance our homes have a charm all their own; and so might our bonnets and our gowns.

Many another fine calculation does the farmer woman make to have thwarted. She thinks in the early spring time of her herb garden—what a convenience it will be. Also of her flower garden, what a pleasure and pastime through the summer days. And what an improved and neat appearance these will lend to a farm or residence. But, to her utter disappointment and dismay, she awakens some bright morning to find a herd of cattle, or some swine or poultry playing among the much relished cabbages, or the sweet

scented mignonette; or, perhaps worse than either, the front yard and back yard both cut diagonally with an electric railway, mounded upon either side like little graves. Very many disheartening endings very often neatly wind up to such ambitions.

However, sorry indeed am I for men or women who in moments of leisure cannot or will not construct these delightful castles of the clouds, which, like Solomon's temple, rise without sound of either hammer or axe.

HOG RAISING.

By T. H. Mason, Straffordville, Ont.

This branch of agricultural industry has been very much neglected in Canada, and yet we, in Ontario at least, have exceptional advantages for the profitable production of hogs.

In the first place our climate is one of the healthiest in the world for swine; hog cholera and other diseases being practically unknown. This is a very important factor, and gives us a great advantage over the United States and other hog producing nations.

Secondly, our soil and climate are especially suitable for the growth of grains that make the highest quality of flesh. The peas, barley, oats and wheat grown in this province are not equalled elsewhere on this continent. It is true that the United States produces immense quantities of corn very cheaply, but the bacon, hams, etc., produced from hogs fed exclusively or largely on corn are not of the highest quality, and do not command the best price in the European markets. The flesh of a hog fed on corn has a very large percentage of fat and that fat when cured has a yellowish tinge. The lean is deficient in quantity, and not of as high quality as that of hogs fattened on peas or mixed grains and dairy refuse.

In the third place, Ontario is now very largely engaged in the dairy industry, and this industry is being continually enlarged until it has become one of the leading sources of revenue to our farmers, and perhaps the most important export of our country. There is nothing that will so profitably utilize the milk and whey of our dairy industry as swine.

Now, with all these great natural advantages, what are we doing in Canada? Actually not supplying our own home demand; our imports, for a large number of years, exceeding our exports by several hundreds of thousands of dollars annually. It is true that the last year for which I have correct returns (1892) our exports exceeded our imports by a few thousands of dollars, but we should have shipped tons of hog products where we have sent cwts., for there is an immense demand for our product in Great Britain. That country imported in 1891 £11,760,000, say about $58,000,000, of which we contributed $1,145,000; a very small percentage of the whole, but still a considerable amount. It is an important thing for us that we have this trade established, and that our goods have a good reputation in the market, as it always takes time to overcome prejudices and introduce a new trade. I find that for the year ending June 30th, 1892, we shipped of barley, 5,202,768 bushels; wheat, 8,714,154 bushels; oats, 6,414,329 bushels, and peas, 4,432,291 bushels. Now I claim that these grains should have been fed at home and converted into beef, mutton, cheese, butter and bacon, to the great advantage of the Canadian farmer and to the fertility of Canadian farms. The class of hog required for the export trade and the best home trade also is an animal weighing from 150 to 225 lb., live weight, and having a good, long, deep body. Our breeding sows should be long and deep with a good head, short legs and well developed hams, and should be mated with males of the same type. I prefer that the young sows should not farrow until about a year old. In winter, they should have plenty of exercise and a dry, warm bed, a sufficient supply of good nutritious food—enough to keep them in good, strong condition, avoiding extremes—a few roots, some bran, shorts and ground grain with a little salt will be enough. In summer a good clover or grass pasture with plenty of water will be sufficient; if pastures fail, then a little ground food should be added. The breeding sow should be separated from other pigs, say two weeks before farrowing, and should then be fed sloppy food, bran, shorts and a little ground grain, and when the little pigs arrive they will be

strong and vigorous and the sow will have plenty of milk. Reduce the food of the sow at farrowing for two or three days; then increase gradually as the growing needs of the little pigs demand it. When the little pigs are three weeks old have a division in the pen, and a small, low trough for the little ones to run to; give a little boiled shorts and sweet milk, and when weaned they will know how to eat and will not be stopped in their growth. Castrate while with the mother. The food after weaning should be wheat, shorts and milk; as they grow older, gradually add a mixture of ground grain to the shorts, increasing the grain allowance with age. In the summer they should have the freedom of a clover pasture with plenty of water, and be sheltered from storms Feed three times a day all they will eat up clean. It will not be necessary to shut them in pens as they will do much better on the pasture and make flesh cheaper; by the time they are five months old they should weigh from 150 to 170 lb., and may be sold at once. If kept until six months old, should weigh from 200 to 230 lb. The sooner they are sold after they are of a saleable weight the better, for the older an animal is the more it costs to add a lb. of live weight. In an experiment conducted at Ottawa two years ago, it was found that at three months of age it took 3.07 lb. of mixed grain to make a lb. of increase At five months 80 per cent. more, at six months 110 per cent. more grain to make a lb. of increase, and at seven months it required 6.93 lb. of grain or 125 per cent. more to make a lb. of increase, or more than twice as much as was required at three months. This shows how important it is to market your hogs whil young. The fall litters of pigs should come as early as possible so as to be strong and large before winter sets in; the general treatment should be the same as before indicated. The main points for successful winter feeding are warm, dry sleeping place—never let the bed get damp; yard for exercise, so that they can exercise daily; a good supply of wood ashes and charcoal—this prevents indigestion and acidity of the stomach; and careful regular feeding of food with the "chill" taken off. I do not believe in boiling grain for hogs, but in winter I think that it is important to warm it. A few roots, such as sugar beets, carrots or parsnips, make an excellent addition to the winter diet. We feed all grain ground and think that a mixture of grain ground together will give better results than either of those grains fed separately. I am convinced that hog raising, where the animals are handled properly and marketed at from five to six months old, is one of the most profitable branches of agricultural industry. My hogs last summer averaged 167 lb. at 148 days old, and cost me $3.01\frac{1}{2}$ per cwt., everything being charged at market rates, and a liberal sum being added for pasture and milk from the dairy.

SHEEP.

By Walter Riddell, Cobourg, Ont.

But of one of our domestic tribes no trace has yet been found in the rock. Like the cod family among fishes; or the *Rosaceæ* among plants; it seems to have preceded man by but a very brief period. And certainly if created specially for his use, though the pride of the herald might prevent him from selecting it as in aught typical of the human race, it would yet not be easy to instance a family of animals that has ministered more extensively to his necessities. I refer to the sheep—that soft and harmless creature, that clothes civilized man everywhere in the colder latitudes with its fleece—that feeds him with its flesh, that gives its bowels to be spun into catgut with which he refits his musical instruments; whose horns he has learned to fashion into a thousand useful trinkets; and whose skin, converted into parchment, serves to convey to latter times the thinking of the first full blow of human intellect across the dreary gulf of the middle ages.—*Hugh Miller in Testimony of the Rocks.*

The sheep was probably the first animal domesticated by man. From the earliest times the keeping of sheep has furnished a source of profitable employment to mankind. We are told in the Book of Genesis, that Abel was a keeper of sheep, and that he brought an offering unto the Lord "of the firstling of his flock, and of the fat thereof," and from that time until sacrifices ceased to be made, more sheep were offered than any other kind of animals. In the Holy Scriptures there is no other animal from which so many beautiful similes are taken, or to which such tender and touching allusions are made as sheep, their habits and keeping. From the earliest times the tending of sheep was the chosen employment of prince and patriarch, priest and prophet, their sons, and in some cases

their daughters also. At the birth of Christ shepherds were honored, they being the first to whom the best news ever brought to our world was revealed, "as they kept their flocks on Bethlehem's plains by night." Of course those times and climes were very different from ours. The flock ranged over extensive plains without an owner, under climates where a plentiful supply of food was at all seasons provided by nature. Little manual labor was required, and when water or pasture failed in one place, they could easily move to another. We know of no animal so capable of enduring a great variety of climates and situations as the sheep; and this it does, not by turning to the elements a stubborn front, but with the meekness of its tribe it entirely changes its habits to suit the locality. We find sheep in every diversity of situation, from the icy floes of Cape North, to the parched sands of the Sahara. This facility of adaptation peculiarly fits the sheep to be the friend of man under his ever varying circumstances. Time will not admit of my saying anything about the many different varieties or breeds of sheep, my own experience has been confined to long or rather to the middle-wooled class of sheep—but an esteemed friend, the late A. Black, of Percy, who was at one time the largest breeder of fine-wooled sheep in this county, has often told me that fine wooled sheep were the most profitable, and that he regretted to see so much foreign fine wool brought to our factory, which, he thinks, our farmers might grow with a fair profit to themselves and benefit to the country. The selection and management of any particular breed of sheep must after all become a matter of dollars and cents. The question the farmer has to consider is, what kind of sheep will in the long run, on his farm, return the most profit: and this question must be viewed strictly in relation to the management he means to adopt, and to the particular farm on which he may be located. The question is not merely which breed will make the most mutton or wool, but which will make it in the shortest time and on the least food—that is, make the greatest profit from a given quantity of food. There are various methods of keeping sheep. Some choose a favorite, fashionable breed (with a long pedigree) and buy or keep nothing but the very best specimens of the breed—that is they keep a breeding flock—to supply other breeders with a change of rams, or to supply those wishing to begin a new flock. This may be looked upon as the highest and most honorable branch of the business requiring the most skill, judgment and taste. With sufficient capital and skill, this is no doubt the most profitable method. Another method which was, and possibly is still, followed on the other side of the lake, was immediately after harvest to purchase as many sheep as were needed—pasture them on wheat and clover stubbles during the fall—feed them clover hay, straw, and corn, or other coarse grain during the winter, and shear and sell them in the spring and early summer. In this way large profits were sometimes made, and at any rate they used up the straw, clover hay and coarse grain on the farm, thus making a large quantity of first-rate manure for fall wheat or any other crop. With us the commonest method is to keep a regular flock of sheep—as many as the farm will feed—and sell their wool and lambs not needed for home use or to maintain the stock, taking care always to keep the best ewe lambs, selling the ram lambs, and old ewes, or they may be fattened during winter and sold in the spring. On low flat land especially sheep should never be kept till they are old: on such lands five or at most six years is old enough. After the sheep becomes five years of age, the wool grows coarser, and the fleece tighter every year, and there is greater risk of death. Each year, if the inferior sheep are disposed of, and only good rams are used, the flock will improve rapidly. No animal is so quickly, or so easily improved as the sheep. A farm can be stocked with sheep with less outlay than with other animals. Like all other animals the sheep is subject to diseases, but in the case of no other domestic animal is the risk of loss by death so small. It has been said: "It is as healthy and hardy as other animals; and, unlike all others if decently managed a good sheep can never die in the debt of man. If it dies at birth it has consumed nothing; if it dies the first winter its wool will pay for its consumption up to that period; if it lives to be sheared once, it brings its owner into debt to it: and if the ordinary course of wool production and breeding goes on that indebtedness will uniformly and with accelerated rapidity increase until the day of its death."

If a horse or steer dies at two years old, or a cow before breeding, the loss is almost a total one. A small flock of sheep require but little time and attention during the busy

periods of the year. They will occupy any part of the farm that may be distant from the homestead, or waste land that is too steep, or too stony to plow and unsuitable for tillage. Without doubt sheep are the very best stock to enrich land while pasturing. They range over the whole field, and hardly refuse anything. Their manure is rich, and scattered in the very best form it could be applied, as a top dressing; there is little waste by exposure. The sheep frequent the knolls where the grass is sweet, and thus enrich the highest parts of the field. A German writer says: "The droppings of 1,000 sheep for a single night will manure an acre sufficiently for any crop." This manure is said to be rich in ammonia, the very best kind for wheat. Farmers who summer-fallow for wheat might in the fall sow the land intended for fallow with rye, which could be pastured with sheep in the fall and spring up till the middle of June. The sheep manure would help to enrich the land, while any rye left could be plowed down. Sheep do not require expensive buildings. They seldom suffer from cold, but ought to have a house or shed to keep them dry in wet weather. Don't keep sheep too much confined. They like a field or yard in which to run in fine weather during winter.

For feeding sheep in winter there is nothing better than good clover hay; with enough of it, they require no other feed. They do very well on good pea-straw, especially when the peas have been thrashed with the flail, and also on wheat, oat or barley straw during winter; but towards spring, when the straw gets dry, they require something better—a few turnips or other roots—or a little grain. They will eat any kind of grain, and are very fond of white beans, which hardly any other animal will eat. Their fodder should always be fed in racks of some kind, otherwise they will waste it.

Of late years our sheep have decreased greatly in numbers. Take the township of Hamilton. By the census returns of 1861 there were 7,472 sheep in the township, while the municipal returns of last year show that there were not quite 2,000. The riding of West Northumberland in 1861 returned 15,067 sheep, while in 1889 there were only 5,472; or taking both East and West Northumberland, the number of sheep has fallen from 39,738 in 1884 to 29,834 in 1888, a decrease of 9,949 sheep in the four years. During the same period the number of sheep in Ontario has fallen off 541,689—a loss of over half a million sheep in five years. Various reasons are assigned for this decrease, such as the low price of wool, the highest price we ever got for wool was 52 cents per pound and the lowest price was 15 cents per pound —in one case over three dollars a fleece, in the other case under one dollar. Though the price of lamb had risen somewhat, it is not enough to make up the loss on the wool. Another reason is the great increase in dairying—our cheese and butter factories have increased, and are found, it seems, more profitable than sheep. Where pastures are good, and factories convenient we suppose this to be so. But the greatest cause for the decrease of sheep husbandry is the number killed by dogs. Few things are more annoying or aggravating to the farmer, after having bred or bought a nice flock of sheep, than to go out some morning and find a large portion of his flock killed by worthless curs. We have known several cases of great losses of sheep killed by dogs. The late Capt. Rowe, R. N., had forty-two sheep killed in one night by two dogs. He always shut in his sheep in the barn-yard, so the dogs had no chasing to do. The ewes too were just at lambing time—some of them had lambed. This took place before the enactment of the present dog law, but in any case he would have got nothing, as his own dog was one of the two. To show the extent of losses of this kind take our own township of Hamilton. During the twenty-six years the present Act has been in force—from 1866 to 1892, inclusive—there has been paid $5,397.88 for at least 1,430 sheep and lambs destroyed by dogs—an average of about $208, and at least 55 sheep and lambs for every year—the average for each sheep being over $3.75. The most paid in any year was $699.67, and the least paid was $33.34. In the abstract returns of municipalities in Ontario for 1880 (the latest we have seen) out of 392 returns from rural municipalities only 114 return the amount paid for sheep killed by dogs, and they report $14,339.36 so paid. If the other 278 municipalities paid in the same proportion there was paid that year $49,305.76. If the value of the sheep be taken at $4 each, there must have been killed by dogs that year 12,327 sheep in Ontario—as only two-thirds the value of the

loss can be paid by the municipality, adding one-third more the loss to the farmer would be over $65,740. But even this is not all, as it is well known that when sheep have been chased by dogs they do not thrive, and are a long time in settling down to their usual quiet habits. We believe other countries suffer as heavy losses in this way as Ontario does. In Ohio during 1888, 59,560 sheep were killed and injured by dogs, the total loss was valued at $146,202. *The Ohio Farmer* of October 27th, 1888, publishes a list for the past eight years of the total number of sheep killed and injured by dogs in Ohio, viz., 432,828 sheep valued at $1,215,747. In 1886 it was reported that 500,000 sheep were killed by dogs in the United States, valued at $2,000,000, besides 300,000 injured on which the loss was estimated at $600,000.

The destruction caused among sheep by dogs has essentially contributed to the decline of sheep husbandry. It not only has inflicted serious, and in the aggregate enormous, loss for the people, but of late years as population has increased it has driven multitudes of persons out of sheep husbandry, and prevented many others from embarking in it. We are no enemy to the dog, as dogs and sheep are always associated together in our minds. Where my youth was spent no one would think of looking after sheep without a dog. They would almost as soon think of sending a man to plow without horses, as send a man to the hills to keep sheep without a dog. Were only useful dogs kept, they would kill few sheep, but it is the many useless, idle curs that do the most mischief. They are a great nuisance. Still, if each dog paid one dollar of tax each year there would be money enough to pay in full for all the sheep killed by dogs.

FARM ACCOUNTS AND MY METHOD OF KEEPING THEM.

By T. C. Wheatley, Blackwell, Ont.

That personal accounts—that is, accounts with those persons with whom we do business—are of the utmost importance all will admit, but by farm accounts I do not mean these. I mean some regular methodical system of records, such as will enable a farmer to know what his profit or loss or surplus or deficit has been upon the year's work. We often hear the complaint, "farming doesn't pay." Now, if such be the case a man has a right to know the "reason why," and if it is paying, as is more likely to be the case, the keeping of systematic accounts alone will enable a man to know how well it is paying. It is often charged against farmers, and I think not without some reason, that their slipshod business methods would, if adopted by the merchant or manufacturer, be almost sure to end in failure; and that the reason farmers do not oftener fail is because theirs is such a safe business that they cannot fail. It has at any rate often been remarked by those in a position to know, that nearly all bankrupts are careless book keepers. A short time ago while visiting with a friend in town who is engaged in the building trade, the conversation turned upon the conditions of business success. He said that some time ago, a few years after he went into business, he happened to be talking with a merchant from whom he got a considerable part of his supplies, and took occasion to complain about the difficulty of "making both ends meet," and of becoming forehanded, when the merchant casually dropped the remark, "It seems to me you do not write enough." He said the remark stuck to him, and opened up a train of new ideas. The result was that after consultation with his wife he made up his mind to keep full accounts for the future of all his business ventures and of his household expenses, and thus to know where the weak point, if any, in his previous management lay. The result was that he had been enabled to work more profitably and live more economically with equal comfort, and was altogether more successful and contented.

Now, judging by my own acquaintance, the practice of book keeping among farmers is the exception and not the case, as it ought to be. Some seem ashamed of their supposed small income and do not want to lay bare the fact even to their own gaze. My father, being a mechanic as well as a farmer, used to say, and I have heard other farmers say, that he could not earn more than twenty five cents a day on the farm and preferred

chiefly turning his attention to his mechanical trade. But he kept no account of what the farm brought in, and forgot as many do, that twenty-five cents a day if it represents a man's savings on a small place is better than a thousand dollars a year in some other business but without any saving therefrom. Many do not realize that the farm is earning them a safe and independent livelihood with something over, while another perhaps more pretentious but uncertain calling would not do so.

What I wish to emphasize, however, is this, that a farmer cannot know what he is earning off the farm unless he keeps accounts, and that the feeling of uncertainty connected with this "groping in the dark," so to speak, will deprive him of almost all stimulus to either economy or enterprise, with a consequent loss of contentment, self respect and love of his calling.

But some will say, "I haven't time," or, "I cannot write well." The saying is "where there's a will there's a way." If you adopt some simple method like my own the time required will not be much, and if you cannot write well is there not some member of your family who can and who would be improved by the exercise? A son of mine, a boy of 12, had been reading what the poultry manager had been doing at the Central Experimental Farm and conceived the idea that he would like to know what our own flock were doing, so I said to him: "Ed., if you will take care of the hens and keep a correct account of income and expenses this year I will give you half the profit." "All right, father," said he, "I'll do it." So providing himself with a book made of a few sheets of note paper with a brown paper cover, he began, entering first on the Dr. side, so many hens so much, and continuing with each bushel of grain or bag of middlings at its proper value together with all eggs required for setting, etc. On the other side of the account was entered sales of eggs and dressed poultry as they occurred, together with the correct number and value of those used at home, as recorded on a sheet tacked up for the purpose in the pantry, and finishing off with a fair estimate of the value of the hens and pullets in the flock at the end of the twelve months. At first, of course, there were some blots and erasures, but a correct and clean copy was transferred to a better book and the work has now been continued for three years with the result that at fifteen years of age he could, if required, keep the books of the farm as well as I can myself. It is almost needless to say that the bargain has been mutually satisfactory. I found out that poultry raising paid, and the boy that good care meant more pocket money, while it has helped to lay the foundation of habits of thrift and kindness to animals likely to be of value to him all through life.

But I started out to tell you about my own methods of keeping "farm accounts." It has been a kind of evolution. At first, when I went on my new farm, 25 years ago, I grew little and required little, so that I only kept a memorandum book—a small one—which answered for a weather and work record, as well as for purchases and sales. Every one should at least do this. But when I married four years afterwards, and the place had begun to yield considerable, my wife said "Let us keep account of our income and expenditure." So we got a grocer's pass-book and ruled parallel columns for different departments of household outlay, putting the farm outlay by itself on another page. Other pages were occupied with mixed items of farm income. These added up and balanced gave us a tolerably correct idea of how we were getting along and answered for the first year or two. Being often required to give credit to customers, I then got a stronger bound pocket ledger and used that for the double purpose of accounts with customers and farm and household accounts. But I found that a book large enough for this was inconvenient for the pocket and hit upon the plan of carrying a smaller pocket ledger, one of those index-lettered on the edge, in which all accounts with persons I do business with either of purchase and sale, or loan and repayment were entered; and I get a new one every year or two as required.

For my regular farm accounts I now keep two books, short rather than long in shape, to avoid long columns in adding and large enough to last ten or twenty years. One book I label "Income," in which I enter sales of produce or produce used in the house, of my various crops, as shown on the example before you, viz. Vegetables, small fruits, apples and pears, peaches, animal products and miscellaneous. The other book I label "Expenditure," in which I enter expenses whether for goods bought outside or raised

at home, under the several heads: groceries, dry goods, boots and shoes, flour and meal, meat, poultry, butter, etc; fruit and vegetables, books and stationery, medical, benevolent, fuel and sundries, farm running expenses, and farm capital account—under this last head entering all permanent improvements like buildings, fences, drainage, etc. I make my financial year begin with the first of May, having found that at that date the previous year's crop is about all sold and the coming year's work just begun. I open the present year's accounts, however, earlier than that date if seed and fertilizers, etc., are bought earlier, and keep the past year's accounts open a little longer if anything remains unsold, thus saving the trouble of putting "merchandise on hand" into the inventory. Then I make out a balance sheet in which the various classes of income are added together and the farm running expenses deducted therefrom, thus:

Total income (say)	$850		
Running expenses	250		
Net income		$600	
Household expenses (say)		400	
Surplus			$200
Capital outlay (say)			100
Cash balance			$100

Other farmers would, of course, have different income accounts from mine, such as grain, dairy, poultry, hay, beef stock, sheep, etc., according to their own needs. Where much young stock is kept and there are many expensive implements, a constant increase in value of the former and depreciation of the latter will be taking place, and every farmer will need to balance his inventory with that of the preceding year and the increase added to miscellaneous income or the depreciation to running expenses as the case may require.

I will in conclusion express the hope that if any of my hearers have not commenced to keep a set of farm accounts they will now begin. I am sure if they once do so it will be a great source of present satisfaction and a constant stimulus to do your best during the coming year.

CORN AND ENSILAGE, HOW TO GROW, ETC.

By Jas. E. Gould, Uxbridge, Ont.

In these hard times agents are as plentiful as black flies in Muskoka in July. They are as various as the different kinds of corn tried at the Experimental Farm. When an agent approaches a farm the first thing he attempts to do is to prove by every kind of argument, in which he well skilled, that the kind of article he represents is actually required by his victim, and if he succeeds then the second is to prove that he has the best article of the kind. Now, although not an agent, I would say that the most essential thing a farmer requires to day is *cheap fodder*. I don't imagine any farmer so insane as to dispute this. Then I say that corn ensilage is the best article of the kind. What are the possibilities of corn ensilage? Compare it with a crop of hay. On the average an acre of ground will produce one and one half tons of hay. Six acres will produce nine tons, the value of which in the barn would be about $8 per ton, total $72. Six acres of corn, ordinary crop, would produce 100 tons, and as two tons of corn is worth for feeding purposes as much as one ton of hay, the 100 tons of corn would be worth $400 put in the silo. The cost of harvesting the nine tons of hay would be about $5 per acre (including labor and rent of land) or $30, leaving a feeding profit of $42. The cost of

the 100 tons of ensilage would be: seed and labor about $1 25 per ton, $125; rent $4 per acre, $20, total $145; leaving a feeding profit of $255 for corn, as against $42 for hay. Or again, six acres will grow 100 tons of corn, and it would take about 33 acres to grow 50 tons of hay, so that the growing of fodder by means of corn can be done on a much smaller area of land; or in other words, by the use of corn fodder more than three times as much stock could be kept on the hundred acre farm than could be kept by means of the hay.

How to grow the corn. I am not egotist enough to say that the following is the best plan, but after four years of experience and extensive reading of the different methods adopted by practical dairymen, I have adopted it as the best. The manner of preparing the ground is similar to that for turnips. Scotchmen will understand this, for nine cases out of ten where you find a Scotch farmer you will find turnips.

I plow early in the fall the field selected for the corn, turning over lightly and harrowing so that foul seeds may start, manure about fifteen loads to the acre or more if I have it, and plow it late the same season. Farmers who have their land clear from obnoxious seeds would save a lot of trouble and valuable waste by drawing the manure out in the winter and spreading as fast as made in the stable if the land is not too rolling. Cultivate and harrow two or three times before planting so as to get a good warm seed bed and then roll.

Now as to the kind of seed to be planted. The first requisite is a seed that will mature early, and second that will yield a good crop of both ears and stalk. I have grown Mammoth Southern Sweet, Red Cob Ensilage, Thoroughbred White Flint, and Compton's Early. In this northern locality the two first did not mature, and while they yielded a large crop were comparatively valueless. The Thoroughbred White Flint was grown one year, and I am not sure if I was not to blame that I did not get a valuable ensilage, in the manner that I planted and cultivated it. The Compton's Early gave entire satisfaction as to maturity and proportion of ears to stalk, but was deficient in quantity. It made excellent ensilage. I intend planting several varieties, such as Red Blazed, Mammoth Cuban, Improved Leaming, (as experiments), planting six acres of Compton's Early and one and one-half acres of each of the others.

How to plant. The preservation of green fodder, although practiced over 2,000 years ago, has not been done to any great extent until within the last few years. The last four years have brought the knowledge and practice nearly to perfection. Four years ago the information to be obtained was very meagre in this part of the country. No information was obtained except how to build a silo (an expensive one) and to cut and put in the corn in its green state. Experiments have been carried on extensively lately and are still going on.

Corn is essentially a sun plant, and to arrive at its best requires room. The object of every seed is to produce seed of its kind. The object of the corn plant is to produce ears. If you deprive it of this function by planting too thick its occupation is gone, and it is like many men to be seen in town holding up the sides of the hotels without an object in life except the mere fact of existence. You practice the principle in other grains and in turnips when you discover that there must be room if a successful crop is to be grown.

The most successful farmers plant in hills so as to be cultivated both ways. Here is a rule that may be safely adopted: Plant your corn in hills, four grains to the hill, hills to be four inches to every foot that the corn grows high. For example, Compton's Early grows about nine feet high; four times nine equals thirty six inches. Plant Compton's Early thirty-six inches apart each way. Experiments by several well-known farmers in Wisconsin have in every case proved that the crop grown in hills has yielded more to the acre and of a better quality than that grown in rows. There is another great advantage. The corn can be cultivated both ways and an immense amount of labor saved in the hoeing. The plan I have adopted after much knowledge gained from the experience of others as well as my own is as follows: We left the ground rolled. Mark lines north and south four feet apart. Commence on the south side and mark lines east and west three feet apart for the short variety (Compton's Early), and if a taller variety is planted make these lines farther apart. Thorough-bred White Flint will grow twelve feet and

should be forty-eight inches each way. Get a corn planter (cost about $1.50) and a man will plant four acres in a day. Plant about 15th to 20th May. The object is to get the corn in early, but so as to be safe from frost.

Cultivation after planting. If the ground is dry and well pulverized, as soon as the corn appears you may (and should) harrow with a good set of sharp harrows frequently until the corn is six inches high. Should the ground be wet so that the teeth of the harrows will gather dirt and make a clot on the point of the teeth or should the teeth be dull, there would be a danger of pushing out the plant. When the corn is up so that harrowing ceases, constant cultivation with scuffler and hoe should go on so as to keep down all weeds and stir the soil. Care must be taken not to go too close to the plant with the scuffler or the roots will be displaced, and as the corn grows the cultivation must be lighter. In no case allow the dirt to be thrown against the corn. The reason for this is that the stalk shoots out fibres at the first joint above the surface. If you cover that joint it immediately commences on the joint above and time is lost. The cultivation should go on until the corn is four feet high, and even after that should there be a fall of rain and the surface gets baked it should be broken up. Corn should never be planted on any but dry or well drained lands, nor on any land where the water would stand after a rain, as the water would check the growth of the plant. If these suggestions are followed out the corn will get such a start that you may safely leave it until the other work on the farm, haying, harvesting, etc., are completed. The crop will be ready for the silo about the middle of September.

A cheap silo. I and two other farmers went to Aurora to see Mr. Russel's round silo, and were very much impressed with its construction and more especially with its cheapness. We found a huge tub 18 feet in diameter, 20 feet high. That was the silo. There was no roof on it, only a few boards thrown over the top, which were not even a pretence to keep out the rain or snow and we expected to find a queer mess of stuff inside. To our astonishment we found the best ensilage any of us had ever seen. It filled "the bill" as a silo for keeping ensilage in the most perfect condition. Now as to the construction. It was made of two-inch plank 20 feet long, formed in the shape of a cistern except there was no rims on the inside. A temporary rim was placed inside until the whole was in place and the hoops on, then the temporary rim was taken down. The hoops were made of $\frac{3}{4}$ round iron and were seven in number. Each hoop was in two pieces and each piece had a thread and nut. The ends were passed through a cast iron block about six inches long with two holes through it, so as to let the ends pass each other. When all the planks were in position the hoops were put on and drawn up tight by means of the nuts. There was a cedar plank foundation on which the "big tub" set. There were three holes about 12 x 16 inches to admit of emptying as required for feeding, and these were fitted with beveled plank that could be removed as required. The plank was neither planed nor painted, merely jointed, and when in position Mr. Russell said daylight could be seen through the cracks, but that as soon as the damp ensilage went in the lumber swelled so that it was perfectly tight.

This is all that is required to store the corn for ensilage. In my last communication I put the cost of a silo to hold 90 tons at $75. This kind of silo with the farmer's labor can be built at an outlay of about $50 for 100 tons. A silo 18 feet in diameter and 20 feet high will hold 100 tons. The cost to build would be about as follows: It will take 2,240 feet of plank at say $12 per M, $25.88; the hoops would cost about $12, cedar for sills $4, jointing the plank about $4, incidentals $4, total $50.

How to build it. Any farmer who has brains enough to farm, with a couple of assistants can build it. Level your ground, then strike the circle, lay down your cedar plank and cut the ends so that they will fit. Strike the circle on the plank. Have two of the hoops ready and lay on the circle to see that they are the same size. Raise one of them up say 12 feet with stays so that it will be in position exactly over the other. Raise the other two or three inches from the foundation by means of blocks. Set up the first plank having a man on each side of it with a step ladder or any other contrivance that will enable them to reach up to the upper hoop. Drive a four inch wire nail through the plank just below the hoop while the man on the outside bends it round the hoop. This will keep the plank in position. Do the same at the bottom hoop. Set up the next

plank as close as possible and do the same, and so on until all the planks are in position, taking away the stays as fast as you come to them. When all are in position tighten the two hoops, when the others can be put on. Caution—don't tighten the hoops too tight if the lumber is dry as there will be danger that the lumber will swell enough to burst them. You can put on any roof you like, but it is not at all necessary. A few poles thrown across and some straw put on the poles is all that is needed. In the silo next to where you feed cut out about three holes two feet square and say four feet apart, bevelling the edges, then fit doors with bevelled edges to them in the holes.

When to cut. Commence to cut when the best ears are ripe and continue until all is cut or the silo full. Should you have more corn than the silo will hold at the first filling, wait a week until it is settled and go on again. Care must be taken to have the leaves, stalks and cobs well mixed. It will pay to keep two good men in the silo all the time it is filling, that is if you have a gang running so as to keep the machine going constantly. They should tramp the *whole surface* and particularly around the edge. I know some say it is not necessary to tramp the whole surface. The object is to force out the air which has to be done and which is done by the settling, and my experience has shown in favor of the tramping. I saw ensilage to-day that was put in 20 months ago and was as good as when first put in, and was thoroughly tramped.

This paper is not intended to go into the feeding of cattle, either for beef or milk. I would just remark in closing that unless ensilage is fed with judgment, the results may not be good. If, however, ensilage is fed with cut straw and different meals, so as to constitute a balanced ration the flow of milk can be kept up in the winter months to as high a standard as in the summer. Grow corn—grow lots of it. Build a silo and build a large one. Feed your cattle and feed liberally and the financial results will be certain.

THE FARMER'S GARDEN.

By G. C. Caston, Craighurst, Ontario.

No farm can be considered complete or thoroughly equipped without a fruit garden. And yet how many, or rather how few farmers have one. Those who have are able to enjoy many of the choicest luxuries of nature which Providence has placed within their reach. And those who have not are not living up to their privileges.

The chief objection raised to the culture of fruit for home use is that there is not time to attend to it. Everyone who is at all acquainted with the press of work on the farm during the spring and summer knows there is some force in this objection. But here let me quote the old adage "Where there's a will there's a way." Moreover, in answer to the plea of want of time, let me ask how is the supply of fruit for the use of the family to be obtained, for I am sure no one in this favored country would think of doing without it. If you buy it in the same quantity as you would get off a small, well kept garden, it will cost more than the cultivation of the garden would cost, and with the added advantage in favor of the garden that you get it fresher and of better quality in your own garden than you can get it from dealers, as fruit is deteriorated by handling and carriage. Then, if the fruit supply is obtained by picking the wild fruits, more time will be lost in picking them than would be required to keep the garden cultivated. Now the time required will not be an obstacle in the way, if the garden is laid out right. And just here is where the great mistake is made. The garden is usually laid out in a small square patch, enclosed around by a fence, and requiring all the work to be done by hand. Everything is planted too close together in order to get as many plants as possible into this small circumscribed space, and in a short time vines, plants and weeds get mixed in a hopeless tangle, and the whole thing is voted a nuisance, and more bother than it is worth. Now, on the farm there is plenty of room, and the farmer need not, like the town or village man whose operations are confined to a small space, do all the work by hand. But the farmer's garden should be laid out in a long narrow strip so that most of the work of cultivation can be done with a horse. The land should first be thoroughly manured and well

cleaned. It is a good plan to summer-fallow after manuring well, so as to get the land in good tilth and to destroy all foul weed seeds. This preliminary work will pay in the labor saved by starting with a clean rich soil. After planting it will pay best to use some good brand of commercial fertilizer, (a very little will do). Nitrate of soda, and hard-wood ashes make a good fertilizer for small fruits The reason for this is that in using barnyard manure we are sure to get weed and various grass seeds, which cause trouble in the fruit garden. But having the land clean to start with it may be kept that way by a little cultivation and the use of a manure containing no foul seeds. Plant everything in long rows sufficiently wide apart to allow of cultivating with the scuffler or horse hoe.

Strawberries should be planted in rows forty-two inches apart, and the plants twelve to fifteen inches apart in the row. I prefer to plant in September if the ground is in a moist condition at that time; if not, if the ground is dry, it is best to wait till spring. Good healthy plants with plenty of root should be used, and in planting the roots may be shortened a little, say to about four and a half inches for convenience in planting, and enabling the planter to more easily place them in proper position. The soil should be firmly pressed about the roots when setting. If set in spring they should not be allowed to bear any fruit the first year. Clip the blossoms off, and let the plant turn all its energies to throwing out runners and the production of new plants for next year's crops. The frequent use of the cultivator during the summer, particularly if the weather is dry, will help the growth wonderfully and keep the runners in place as well, and thus form the matted row, the most convenient form of strawberry culture for the farmer. By setting the cultivator to suit, the rows are easily kept of the proper width, and the best results will be obtained by not allowing the matted row to be more than twelve or fourteen inches wide. This will give fine quality and quantity as well, and leave room between the rows for cultivation. Two crops or at the most three, is all that can be got from one planting, hence the necessity of planting a few fresh rows every second or third year. But so prolific is the strawberry that three or four rows say 150 feet in length will, with ordinary care, produce all the berries that an average sized family can consume, using them fresh every day throughout the season, and sufficient for canning purposes as well. Early, medium, and late varieties should be planted so as to extend the season as long as possible. Such varieties as Lovett's Early, Wilson, Crescent, Williams, Bubach, Haverland and Manchester, would be a good selection.

Raspberries should be planted in rows five or six feet apart, and three feet apart in the row. The varieties that will give the best satisfaction would be Cuthbert and Shaffer's Colossal in reds; and for yellow kinds Golden Queen would fill the bill. In black caps I would recommend Hillborn and Gregg. The Cuthbert is by far the best red table berry, and anyone who is fortunate enough to have them every day through the season at meals, would not do without them. The Shaffer is a cross between the red and black cap and partakes of the nature of both. But as it can only be propagated from the tips, it is often classed as a black cap, though dark red in color. It is a good bearer and excellent for canning for home use.

In blackberries the Snyder would do best for most sections, and would require about the same treatment as the raspberry.

The cultivation and care of the raspberry is easy and simple. When the canes are about thirty inches high they should be stopped by pinching off the terminal shoot. This will cause them to throw out side branches and grow stocky and strong so they will stand up straight and not sprawl over in the way tall canes will do. The old canes must be cut out each year either in the fall or spring, and about eight or nine new canes allowed to grow in each hill every year. All other sprouts should be kept down with the hoe and cultivator and where the winters are very severe, it is best to stop cultivation about the time the berries are picked, so that the wood will ripen up well before cold weather, and not encourage a late growth. A raspberry plantation will, if attended to, last for fifteen or twenty years and bear well.

A few currants and gooseberries should also form part of the fruit strip. These should be planted in rows about the same as the raspberries. They should get a little yearly pruning to remove the old wood and keep the bushes open to sun and air. I would recommend: Currants—Red Cherry, Fay's Prolific, White Grape, Black—Saun-

der's and Black Naples. In Gooseberries—Houghton and Downing, being free from mildew, will probably give the best satisfaction. The gooseberries and red and white currants will require a little extra attention at times on account of the caterpillars, but a timely use of hellebore in water easily keeps them in check.

The garden is not complete without a few grape vines. The grape being a perfect food is one of the most wholesome articles of diet. Very little time or trouble will be required to grow an abundant supply for home use. They should be planted ten or twelve feet apart, and pruned on the Fuller or fan system, as found most convenient, and in sections where the winters are severe laid down and covered in autumn.

For most sections it is best to select hardy and early ripening varieties. A good selection would be: for black—Moore's Early and Worden; for red—Moyer and Delaware, the latter being especially suited for clay soils; white—Jessica and Moore's Diamond.

And now in conclusion let me urge everyone who has not one already, to plant a fruit garden, and if planted and cultivated on the lines I have indicated it will be a surprise to find how easily the thing is done. It will be found that the little strip of fruit is the best paying thing on the farm, as well as the most attractive. The cultivation of it and the enjoyment of its products has a very wholesome effect upon the health, as well as a refining and elevating influence upon the character, by bringing us into closer communion with nature and her bounties, which a kind Providence has placed within our reach. It is among those things which help to delight and adorn existence, and adds a peculiar and undying charm to that noblest and best of all pursuits, the science of agriculture.

STEAM WHISTLES AND FLAGS AS WEATHER SIGNALS IN RURAL COMMUNITIES.

Mr. W. B. Leavens, of Chisholm, contributes the following description of two codes of signals—the one appealing to the ear and the other to the eye—which we think will be interesting and suggestive. There are but few districts in the more settled portions of the province where steam-whistles are not within ear-shot, while flags can easily be displayed upon milk wagons going over their routes, or by the mail stages.

The use of steam-whistles for announcing the weather forecasts has rapidly grown in favor among farmers. Whenever a mill or factory using steam is within the reach of the telegraph or telephone, or by evening or early morning trains or stages, the daily forecasts can be received and announced to farmers and others living within a circle of several miles.

Explanation of Whistle Signals.

Note.—The warning signal to attract attention will be a long blast of from fifteen to twenty seconds duration. After this warning signal has been sounded, long blasts (of from four to six seconds duration) refer to weather, and short blasts (of from one to three seconds duration) refer to temperature; those for weather to be sounded first

Blasts.	Indicate.
One long	Fair weather.
Two long	Rain or snow.
Three long	Local rains.
One short	Lower temperature.
Two short	Higher temperature.
Three short	Cold wave.

Interpretation of Combination Blasts.

One long, alone.....Fair weather, stationary temperature.
Two long, alone.....Rain or snow, stationary temperature.
One long and one short .....Fair weather, lower temperature.
Two long and two short.....Rain or snow, higher temperature.
One long and three short .....Fair weather, cold wave.
Three long and two short.....Local rains, higher temperature.

It is found that owners of mills and factories are very willing to co-operate with farmers and others in the use of the whistle signals. The practical value of knowing through these signals a day, or a day and a half in advance, with reasonable certainty—and it is becoming more certain all the time as the system is improved—the changes in the weather, the coming of storms, frosts or cold waves, as announced by the Weather Bureau of the Department of Agriculture, is almost beyond estimate in dollars and cents.

The Weather Signal Flags—Their Meaning and Interpretation.

Number 1, white flag, indicates clear or fair weather. Number 2, blue flag, indicates rain or snow. Number 3, white and blue flag, indicates that local rains or showers will occur. Number 4, black triangular flag, always refers to temperature; when placed above numbers 1, 2 or 3 it indicates warmer weather; when placed below numbers 1, 2 or 3 it indicates colder weather; when not displayed, the indications are that the temperature will remain stationary. Number 5, white flag with black square in centre, indi-

No. 1. No. 2. No. 3. No. 4. No. 5.

cates the approach of a *sudden* and *decided* fall in the temperature, and is usually ordered at least twenty-four hours in advance of the cold wave.

Interpretation of Displays.

No. 1, alone, indicates fair weather, stationary temperature; No. 2, alone, indicates rain or snow, stationary temperature; No. 3, alone, indicates local rain, stationary temperature; No. 1, with No. 4 above it, indicates fair weather, warmer; No. 1, with No. 4 below it, indicates fair weather, colder; No. 2, with No. 4 above it, indicates warmer weather, rain or snow; No. 2, with No. 4 below it, indicates colder weather, rain or snow; No. 3, with No. 4 above it, indicates warmer weather with local rains; No. 3, with No. 4 below it, indicates colder weather with local rains; No. 1, with No. 5 above it, indicates fair weather, cold wave; No. 2, with No. 5 above it, indicates wet weather, cold wave.

STRAWBERRY CULTURE.

By W. W. Hilborn, Leamington, Ont.

It is doubtful whether there is a farm in Ontario on which strawberries cannot be grown profitably for family use, and still there are thousands of farmers that do not grow them. This should not be the case, as they can be grown with so little trouble and expense. Strawberries ripen during the heat of early summer, when such an addition to the diet is most healthful and necessary.

Many have been deterred from planting the strawberry from the fact that their culture is not understood. It is a common opinion that a great deal of work is required to make them succeed. When grown in the old fashioned way of planting in beds in a garden or enclosure this is true. All the work has to be done by hand, mostly at a time when the farmer is so busy with his spring work on the farm he cannot attend to the strawberry patch. The location of a suitable place for the strawberry plantation often has much to do with the success or failure of it. Especially is this true with the farmer who has but little help, and can ill afford the time to give them proper care. This class of farmers are very numerous, and it is the purport of this paper to make the method of culture so easy and simple that many who do not now grow the strawberry will be induced to grow at least enough for family use.

Soil.

Any soil that will produce a crop of corn or potatoes will answer for strawberries. A rich clay loam is to be preferred, next, a sandy loam. Avoid if possible a stiff, heavy clay, as much more difficulty will be experienced in working a heavy, tenacious soil. Also avoid any land that has been in sod or pasture a number of years. The *white grub* is the most destructive insect enemy we have to fight in growing the strawberry. It is usually found in the greatest numbers in the soil that has recently been two or more years in sod. A clover sod that has had but one crop taken off will answer. If the soil is not naturally rich it will pay to make it so with either barnyard manure or commercial fertilizers. It should be well drained either naturally or by tile draining.

Location.

Select some convenient place where you will not have to go out of the way to cultivate. You can then go through them with horse and cultivator in a few minutes when you have been cultivating corn, potatoes or other vegetables and never miss the time; while if they were planted in some out of the way place they would often go without cultivation until the weeds got such a start that they could afterwards be cleaned out and cared for only with great difficuity. This is often the cause of failure. It is preferable to select a piece of land sufficiently large to admit of future plantings along one side.

Preparation of the Soil.

If a clay or sandy loam, or a one year old clover sod, it should be well plowed in the autumn. If a light sandy loam, plow in early spring. After plowing, top work the soil thoroughly in the spring as soon as the weather and the condition of the soil will permit. Cultivate deep with a two-horse cultivator and harrow down smooth. If the soil requires manure, apply well rotted barn-yard manure just before cultivating and harrowing. The manure should be well mixed with the top soil but not plowed under. A stiff, heavy loam may have an application of coarse barnyard manure in the fall before plowing. If the soil is stiff or heavy, it should be trenched up in the autumn by turning two furrows together, forming a sharp ridge as when prepared for carrots or other roots. When thus exposed to the action of the frost a comparatively heavy soil will work down fine and mellow in the spring and give good results. Care must be taken, however, never to stir such soil when wet, either with plow, hoe or cultivator. Surface drains should be made to take off surplus water quickly.

Planting.

This should be done as early in the spring as the soil can be prepared as directed above. Mark off the rows with a corn marker about four feet apart. If a marker is not at hand stretch a cord to plant by. Take pains to have the rows straight and of equal distance apart. It adds to the appearance of the plot, and time is saved in the cultivation. Procure plants of the previous year's growth, trim off all old runners and dead leaves and shorten the roots to about four inches. Keep the plants moist and where the wind cannot reach them while out of the ground. This can

easily be done by placing them in a pail or box and covering slightly with soil and taking them out only as fast as required for planting. When planting make a hole with a spade crosswise of the mark and deep enough to admit the roots without doubling them up. This is quickly done by shoving the spade straight down and pushing it backward two or three inches. Take the plant in the left hand, spread out the roots fan-shaped, place the crown on a level with the surrounding soil, fill in and work the soil well in among the roots and press so firmly that by giving a quick jerk on a leaf it will break off without moving the plant.

Cultivation.

As soon as the weed seeds start to grow and appear above ground, cultivation should begin. A fine-toothed cultivator is the best. Stir the soil frequently to a depth of about two inches, especially during the early part of the season. Care must be taken not to stir the soil immediately around the plant or injury will result. Cut off all the blossoms and first runners until the plants have sufficient strength to send out several strong runners at once (which is usually in July), when these may be allowed to take root. The soil between the plants in the row that cannot be worked with the cultivator should be hoed out as soon as the weed seeds start to grow. At this time a steel garden rake will often do the work better and more quickly than a hoe. If the weeds are allowed to grow until they are two or three inches high before hoeing, more than double the labor will be required, and the results will not be so good.

Mulching.

As soon as the ground freezes in the autumn sufficiently hard to prevent horses and wagon from breaking through the crust, a mulch should be applied. This may consist of coarse manure, wheat or rye straw or marsh hay. Most of the material should be placed between the rows with just enough immediately over the plants to nearly cover them from sight. In early spring, as soon as growth begins, rake the mulch from off the plants and leave it between the rows. If the mulch is left on the plant for a time after they begin to grow, it causes a soft, weakly growth of plant that will not produce fruit.

Keeping up the Plantation.

This is often the most difficult problem to solve in strawberry culture on the farm. The usual practice has been to plant out a plot and give good care the first season; result, a fine crop of fruit, with a promise that the strawberry patch shall be cleaned out and cultivated as soon as the fruit is off. This, however, is rarely done; after the fruit has been gathered we do not expect any more until next season. The ground gets too dry to cultivate and the haying and harvesting has to be attended to. The strawberry patch then gets a promise that it shall be cleaned out early the following spring. When spring comes the grass and weeds have such a strong hold among the plants that it is usually decided to let them go without any attention. With this treatment, at the end of the third season the plants will generally be so exhausted that but little fruit is produced and the young plants seldom possess that vigor required for starting another plantation successfully.

By adopting the following plan no difficulty will be experienced, and a crop of strawberries can be grown as easily as a crop of potatoes, and with as little risk of failure.

Plant four or more rows one hundred feet or more long *every spring*, and grow as directed above. This will yield a sufficient supply for an average family, and if a selection is made of early and late varieties the season of ripening may be extended to four or five weeks. A new plantation can be put out every spring and cared for with much less time than would be required to clean out the old one. With this method a supply of strong, healthy plants can always be had for replanting—a most important point in successful strawberry culture.

A plantation can be left to fruit the second season without any cultivation, you will obtain the earliest fruit from this old plot, and in a favorable season quite a large quantity of it. The greatest objection to allowing the plantation to remain for a second crop is, that it so often happens that a new plantation is not set out if the old one is left for a second crop. The chances are therefore lessened for a future supply of both fruit and plants.

Selection of Varieties.

Every season some new sorts are introduced that, could we believe the disseminator's description, would excel all other kinds. But how seldom do we find one of these new highly lauded varieties that proves as valuable as some of the old, well tested kinds. Many of them have a local reputation and prove valuable with special care in localities suited to their wants. It is not possible to give a list of varieties that will do equally well in all localities. If you have a neighbor that succeeds with certain kinds on similar soil to your own, it is usually safer to plant the same sorts. This will generally give better results than to trust new varieties, no matter how much they have been lauded by the disseminator. Occasionally it is well to test new sorts in a small way, but this can mostly be left to those who can afford to experiment.

The following varieties have given satisfaction over a large area. For early, Beder Wood (B.) and Crescent Seedling (P.). For medium and late, Bubach (P.), Wilson (B.), Woolverton (B.), Saunders (B.), Lovett (B.), Williams (B.). Those marked (B.) are bi-sexual or perfect flowering varieties. Those with pistillate or imperfect blossoms are marked thus (P.), and require one row of the former with every three or four rows of the latter to fertilize them properly. The attention of farmers and amateur fruit growers is specially directed to this fact. Many of our most heavily producing strawberries (those marked P.) have only imperfect blossoms, and in order to produce fruit they must have planted along with them, or near by, other varieties (those marked B.), that have perfect blossoms, from which the wind and insects will then carry the pollen to the imperfect blossoms of the other plants.

Those named are vigorous growing varieties and should be planted about one and a half feet apart in the row, and rows four feet apart. They can be relied upon for either home use or market.

Bubach has given the largest yields on light or sandy soils, and the fruit is of the largest size Beder Wood is perhaps the best, first early on light soil, and Crescent on stronger loam. Woolverton and Saunders succeed best on strong rich soil, and with good cultivation will give a crop of fruit that is difficult to equal either in size of fruit or quantity. The fruit is of a dark bright crimson color, of good quality and quite firm for so large a fruit.

Procuring Plants.

Procure plants from your own vicinity if you can get suitable varieties. If not send to some reliable firm that charges enough for their plants to pay for good and careful packing. Poor plants are dear at any price and usually result in failure.

Growing for Local Market.

Many towns and villages throughout Ontario have to procure their supply of strawberries from a distance. Where such is the case it would pay some farmer in the vicinity to grow them for the local market. Begin in a small way and learn the methods best adapted to the conditions and wants of the locality. Strawberries fresh from the field will always bring a higher price than those which have been shipped in by train. There are few localities where strawberries cannot be grown in sufficient quantities to supply the demand, if proper methods of cultivation are followed.

PLUM CULTURE.

By G. W. Cline, Winona, Ont.

Plum growing is a source of profit too often neglected by the farmers of this province. With the exception of perhaps the apple, the plum can be grown more easily and cheaply than any other fruit. The advantages to the farmer in raising plums are two-fold: In the first place, his family can derive both pleasure and benefit from the use of the fruit while ripe and fresh in summer and fall, and also when canned or preserved it can be used in winter and spring. In any of these forms few fruits are more pleasant, palatable and wholesome than the plum. In the second place, the plum is one of the most profitable fruits for market, and this is no small consideration. For these reasons every farmer should have a plum orchard, small or large, as his experience may suggest.

Soil, Preparation and Planting.

Any good, dry soil will grow plums. If not dry, drain the land with tile or stone at least 2½ or 3 feet deep, or pine poles with a slab will do in case the other materials are not available. Plums will do well on all soils, from the lightest sands to the heaviest clays, by planting the proper varieties. A rather elevated situation is better than low land, as the trees in such a location are not so likely to be affected by late spring frosts. In preparing for planting, if the soil is a heavy clay sod, it is best to plow in narrow ridges in August, and harrow well in the spring. Then open out the ridge with the plow deep enough for setting out, plant in the bottom of the furrow and plow the soil back to the trees again: the rotting sod will help to keep the soil moist. For sandy or loamy soil, where the land will not bake by spring plowing, the best way is to plow and leave the furrow just where you want your row of trees, and plant as above. By this means you can plant a large number of trees in a day, and if the soil is properly pulverized and cultivated there should be no loss. If the season is inclined to drouth, mulch with coarse, strawy manure, but do not pour water down by the roots, as that washes the soil from the roots and causes more harm than good. Before planting the young trees it is well to make a thin mortar of fine earth and water and dip the roots into it, in order to keep them moist; do not keep the fibrous roots exposed to the sun or wind. In planting lean all trees towards the prevailing winds, so that in growing they may stand up straight, and and if they should be inclined to lean the wrong way bank up with earth and press them over. When loaded with fruit they are very hard to keep in upright shape, and if once allowed to be bent over with the yield they cannot be brought back to stay in a upright position.

As to the distance apart in planting, 12x16 is sufficient for most varieties, but for some of the larger and more spreading growers 14x16 is better. Among these latter varieties are Glass's Seedling, Quackenbos, Gen. Hand, German Prune, Yellow Egg and Victoria, and where you have land to spare, and it is rather rich, give them plenty of room, and you will not be sorry.

Cultivation of the Orchard.

Having set out your orchard, plant corn, roots or potatoes, and give plenty of cultivation, and if your trees were in good order when planted you will have success. Do not sow grain or turn to grass until the trees are at least three or four years old, when, if they are growing too large and are not blossoming, one season of grain or grass will cause the fruit buds to form; then turn to cultivation again, and you will not be likely to have any further trouble on account of the trees not fruiting.

Varieties.

Look about your own neighborhood and see what varieties are doing well, and in what kind of soil. Plant the best and most successful of these suitable to your own soil and conditions, and you will not be disappointed. Add a few other varieties for testing, but be careful in buying, remembering that the climate and soil vary so much in Ontario

that no list of varieties would stand everywhere in the province. If growing for profit, I would advise the planting of only a few varieties of tried reputation. Do not take the advice of any agent who comes along as to what sorts to set out, as such individuals are generally most anxious to sell what has been sent out with much puffing, one-quarter of which may not be true. Buying after this fashion is filling the province with worthless varieties of fruit. Do not buy more than a tree or two of any new variety.

My list of plums for my own locality, as well as for all the southern part of the province and some of the northern portion, in order of ripening, is as follows; Bradshaw or Niagara, Duanne's Purple, Imperial Gage, Washington, Smith's Orleans, Huling's Superb, McLaughlin, Lombard, Pond's Seedling, Glass's Seedling, Quackenbos, Yellow Egg, German Prune and Reine Claude de Bavay. The above are for clay or clay loam, and all are good growers and good bearers. For a sandy soil, which is not recommended as the best for plums, I would suggest: Duanne's Purple, Imperial Gage, Washington, Huling's Superb, McLaughlin, Lombard, Glass's Seedling, Reine Claude de Bavay and Coe's Golden Drop. In addition to the above are many more worth trying for those who care to experiment with varieties, such as Canada Blue, Peter's Yellow Gage, Genii, Jefferson, Fellemburg, Shipper's Pride, Shropshire Damson, Grand Duke, Saratoga, Field, Victoria, Gen. Hand, Prince of Wales, Red Egg, Lawson's Golden Gage, Prince's Yellow Gage, Bingham, St. Lawrence, Munro Egg, (Canada Orleans,) Prune de Agen and Abundance.

The Use of Fertilizers.

If the soil is not naturally rich it is of the greatest importance that some fertilizer should be applied. Barnyard manure, on account of the nitrogen it contains, is probably the best, but ashes and bone meal are generally required when the orchard is in full bearing condition, and these may each be applied at the rate of about 200 pounds an acre. Some soils, such as clays of a greasy nature, are full of potash, and consequently require only nitrogen and phosphate (or bone), and to use ashes on such land would be simply throwing them away. But in the case of sandy or loamy soils, where there is plenty of sorrel growing, the opposite is the case, and the ashes should be applied to sweeten it. Plum trees have been known to bear well under neglect, but that was where the new soil was rich and there was no black-knot or curculio to attack them. Now all this is changed, and if you want a long lived, profitable orchard, do not neglect to give the best of care in cultivation and fertilizing, or otherwise black-knot, bark sun-scald and death will finish them.

Black-knot.

I had so much black-knot a few years ago that I thought I was going to lose my orchard. However I commenced cutting off the knot and burning it. Three times a year—in July, September and February or March—we went through the orchard, and also fertilized it well with nitrogen, phosphoric acid and potash. Trees revived where nearly dead, and at the present time I have but few cases of black-knot, and they are hard to find.

The Rot.

The rot is a very serious disease, and it has been increasing for some years. I am now fighting it with Bordeaux mixture and sulphur, and I also pick off all rotten fruit, scalding them or burying them deep in the ground. I believe this is the best remedy, but I would like to have still another season's trial before finally deciding. My plan of operation has been as follows: Apply ammoniacal solution before the buds come out in leaf, then, after blossom, Bordeaux mixture two or three times, and throwing sulphur in the trees about the time of ripening. There are some who think plum rot is caused by a worm. To a certain extent this is true, as the plum is first stung by the curculio; the spores of the fungus being at hand, the root attacks the spot, and by the time the rot has fully developed the worm has worked its way into the plum, and is taken as the cause of the rot. I would advise growers of plums to closely look after all rot, and pick every effected plum as fast as they can be found rotting, and in this way save the crop not only for that season, but make it better for the orchard in the succeeding year.

Insect Enemies.

Of the insect enemies of the plum the curculio is the worst, and it appears to be always with us. My remedy is Paris green, 3 ounces to 40 gallons of water, sprayed on the trees just after the blossoms are all gone. Do not spray before that time, as it will then be of no use whatever After the first application spray again at intervals of a week or ten days if no considerable amount of rain has fallen, but if heavy rain occurs spray oftener. I have sprayed as often as six times during the season with no harm resulting to the trees or foliage. When coming to the bottom of the barrel we have sometimes found that the solution was rather strong, and that some of the leaves have been scorched, but never sufficiently so as to damage the tree for future bearing. Be careful and weigh your Paris green. *Do not guess*, as some men, more especially employees, are inclined to do. Few men have an accurate idea of size or weight. In battling with the curculio Paris green has proved most effective with me and far ahead of the old plan of jarring the tree. I have tried both methods, but for twelve years have not jarred, but used the arsenite. The canker-worm is another pest which is also killed by Paris green when spraying for the curculio, and many other injurious worms are also destroyed in the same way. The green aphis, however, is becoming very bad, as it is hard to get at, since its habit is to work on the under side of the leaf, which curls over and largely protects it. For this pest I use coal oil emulsion, and whenever it touches them they are killed. I used only the horse-power sprayer on them last season, but will try the knapsack or a barrel on the stone-boat this summer so as to get close under the trees and thus get all of them covered.

Marketing.

The marketing of plums demands considerable attention. I have always followed the rule to pick only the plums that are ripe; that is, all that are finely colored but not soft. Pack into 12-quart baskets (some prefer 8-quart baskets) and ship to orders, which should be arranged ahead as much as possible. We pick off the same trees for from three to six days, and never send any but the best to market. Many growers pick their plums a week ahead of ripening, and pick all at once, putting on the market what is nothing but a miserable apology for a plum, the fruit being really not fit to eat. It is a shame, and certainly a great mistake from a business point of view, to put plums on the market in so green a condition as to be unfit to be used. You cannot sell your plums well if you pick them too green. If you have secured no regular customers to take your plums, send the fruit on to a reliable commission man (and there are many of them), who can be depended upon to do the very best for an equally reliable customer.

THE FARMER'S APPLE ORCHARD.

By D. W. Beadle, Toronto, Ont.

Apple trees will grow in a great variety of soils, yet will give the best results when grown in a well drained, calcareous clinay loam. A northern exposure is preferable to a southern one, and high ground to low land.

Trees four years old from the bud or graft bear transplanting better than those that are older; at five years after being set in the orchard they will be better trees than those that are much older when planted. They will yield better flavored and higher colored fruit when planted well apart, ordinarily forty feet each way is the proper distance. Plenty of sunlight and free circulation of air are essential to the healthy development of the foliage, in which the processes of assimilation are carried on; in addition the conditions are not so favorable to the growth of the fungus, *fusicladium dendriticum*, which causes the well-known apple scab.

Pruning.

Every spring the orchard should be carefully examined before the weather has become warm enough to start the sap, and the trees pruned with a knife wherever needed, to prevent the head from becoming too dense If properly pruned it will rarely be necessary to use any other instrument ; the cutting off of large limbs should be averted by removing them when small. When it is necessary to take off a large limb, the better plan is to cut away only a part of it each spring, thereby lessening the size of the final cut in its proportion to the size of the trunk, thus enabling the tree to heal in less time.

Varieties.

The varieties to be planted for home use will depend somewhat upon personal preferences, and much upon the conditions in which the planter is placed. It is advisable before deciding upon the kinds, to examine the bearing orchards of the vicinity, and make choice among those that do well in similar soil, exposure and temperature.

The following varieties are named about in the order of ripening: Yellow Transparent, Red Astrachan, Oldenburg, Chenango, Gravenstein, Ribston Pippin, Blenheim Pippin, Snow apple, Tompkins King, McIntosh, Tolman Sweet, Sutton Beauty, Baldwin, Pewaukee, Northern Spy, Grimes' Golden, Golden Russet, Roxbury Russet. A selection can be made from these adapted to a very considerable part of the province.

In planting for market, selection can be made with advantage from Oldenburg, Gravenstein, St. Lawrence, Ribston Pippin, Wealthy, Blenheim Pippin, Tompkins King, Baldwin, Northern Spy, Golden Russet, Ontario, Roxbury Russet, R I. Greening and Westfield Seek-no-further. When planting a commercial orchard it is important to avoid a multiplicity of varieties, and yet not to plant a very large number of any of the following in a block by themselves, for the reason that they are self-sterile ; that is, the pollen does not fertilize its own blossoms : Gravenstein, Tompkins King, Northern Spy, Red Astrachan, Roxbury Russet, Tolman Sweet ; these are self-sterile. The Baldwin and R. I. Greening are self-fertile.

Those intending to plant an orchard for commercial purposes will do well to plant with an eye to the British market, for often that will be our best market, and fruit that will command a high price there will sell in any market. The following varieties when well grown, free from scab and all other impertections, including worms, well graded, honestly and neatly packed, will always command a high price.

The Oldenburg, if picked before it shows any yellow and after it has put on its bluish color, ships well, if properly handled, and arrives there in prime condition. The next in season is the Gravenstein, and it commands the very highest price, next to the St. Lawrence, and close upon it the Ribston Pippin, which when prime sells there for over twenty shillings sterling per barrel. The Blenheim Pippin rivals the Ribston in price. These two varieties when prime will always sell there at high figures. Hitherto the Baldwin has been a profitable apple to send to the British market, and sells well, especially when high colored. Yet it is very questionable whether it will maintain its position, because of its lack of high quality. The Rhode Island Greening is gaining in favor there, bidding fair to outstrip the Baldwin before long. Tompkins King is much esteemed and sells at high figures. The Northern Spy when well grown is also much esteemed in its season.

Spraying.

The fungus that causes the apple-scab has become so very abundant and so widely diffused, that it is important to act energetically and persistently in the use of the most efficient means for preventing it from getting in its injurious work. Unless this is done a large share of many of our very valuable apples will often be unfit for market. The point to be aimed at in this warfare is to kill the fungus spores before they have commenced to grow. As at present advised the most efficient means of doing this is to spray the trees in the spring, once before the buds burst and again just as they begin to unfold, and before the flowers open, with *modified eau celeste* ; after the blossoms have fallen to spray them

twice with *Bordeaux mixture*, to which Paris green has been added in the proportion of ¼ lb. to 50 gallons of the mixture. If the weather is dry, an interval of ten days to two weeks may intervene between the sprayings made before the blossoms appear and between those after the flowers have fallen ; but if it is rainy it will be necessary to spray oftener, even to giving a spraying every week, making three with the *eau celeste*, and three with the Bordeaux mixture and Paris green.

Modified eau celeste is made by dissolving two pounds of copper sulphate (blue-stone, blue vitriol) in hot water, say two gallons. Do not use an iron or zinc vessel. A convenient way will be to put the blue stone into a water-tight barrel and pour the hot water upon it, and stir with a stick occasionally until it is all dissolved. In another vessel, no matter of what it is made, dissolve one pound and a half of carbonate of soda (common washing soda), in say a gallon of water, cold or hot as is most convenient. When both of these have become wholly dissolved, pour the soda solution into the barrel containing the solution of blue vitriol. When the chemical action which will now ensue has ceased, pour into the barrel one quart of ammonia of the strength of 26°, and stir the liquid. In a short time there will be a clear blue solution. Now add enough water to bring the whole up to thirty-two gallons. If convenient to use rain water it is preferable.

Bordeaux mixture is made by dissolving six pounds of copper sulphate in say five gallons of hot water. Take four pounds of fresh caustic lime, adding water enough to make a thin white-wash : fasten a piece of coarse sacking over the barrel containing the solution of blue-stone, and strain the thin white-wash into it. When this is done add enough water to bring the whole up to forty gallons. The cost of this will not exceed one and a half cents per gallon. It is necessary to add the lime in order to prevent the copper sulphate from injuring the foliage.

In order to kill the apple worms before they have time to eat their way into the apples it is necessary to add Paris green to poison the worms. The proportion that is advised is at the rate of one pound of Paris green to two hundred gallons of water. This would require three and one-fifth ounces of Paris green to be added to the forty gallons of Bordeaux mixture. Three ounces, however, will be found to be sufficient. By thus combining the poisonous Paris green with the copper sulphate, we are able to kill two birds with one stone ; to prevent the fungus from making the apple scabby and the young worms of the codling moth from spoiling the fruit.

In order to throw the spray upon the trees it is necessary to have a force pump made for the purpose. This should be of sufficient capacity to enable the operator to work without severe fatigue, for at best it is hard work. The cylinder should be not less than two and a half inches in diameter, with a stroke of five inches in length, and the handle long. It is also important that the working parts should be of brass, or at least brass lined, for the action of the chemicals soon corrodes the iron. When spraying with the Bordeaux mixture, or with Paris green, it is very important to keep the liquid constantly stirred so that the lime and Paris green may not settle at the bottom. One spraying pump is provided with a small pipe, through which a continuous stream is forced against the bottom of the barrel by the pressure from the air chamber, to keep the lime of Paris green, or both when used together well suspended in the water. Whether this result is attained satisfactorily, the writer is unable to say, never having used or seen one in operation.

The best nozzle is that known as the Vermorel nozzle. It is provided with a spindle which can be thrust forward by pressing the thumb upon a button to clear the vent from any obstruction, and which is drawn back by a spring the instant the thumb is removed. This nozzle produces the finest vapor spray, and does not use up half as much liquid to cover a given surface, as other nozzles. The spray can be thrown with this nozzle a distance of fifteen feet, not more ; but a solid stream can be thrown a distance of forty feet, when such a stream is required, by unscrewing the Vermorel attachment.

After using the pump in spraying, always pump clear water through it and the hose and nozzle ; else the lime will harden in the working parts and cause great trouble.

Some Injurious Insects.

If the apple trees are infested with leaf eating worms, such as the canker worms, *Anisopteryx vernata* and *pometaria* ; the yellow necked caterpillar, *Datana ministra* ;

the red-humped caterpillar, *Œdemasia concinna* ; all such can be poisoned by spraying the trees with Paris green in water in the proportion of one pound of Paris green to two hundred gallons of water. The tent caterpillars, *Clisiocampa Americana*, are more easily destroyed by capturing them when they are in their tent, where they are sure to be in the early morning, at mid-day if the sun shines bright, and at evening. The fall web-worm, *Hyphantria textor*, keeps within its web until it has nearly attained its full growth and therefore can be easily captured at any time of day. Sometimes the forest tent caterpillar, *Clisiocampa sylvatica*, invades our orchards ; when it does it usually comes in countless numbers, and can be best destroyed by spraying with Paris green.

Benefits of Spraying.

The efficacy of the means herein mentioned for preventing injury to our apple trees and apples from the apple scab, the codling moth worm, and leaf-eating caterpillars is no longer open to question. They have been most thoroughly and frequently tested, not by one person only, or in but one locality, but by very many persons, in very many places and under a great variety of circumstances ; all testifying to decidedly beneficial results which abundantly compensate for all cost of labor and material. The results obtained by spraying an orchard of Tompkins King last season, 1893, as stated by Mr. E. G. Lodeman, are here given as one of many instances that might be mentioned. The material used was the Bordeaux mixture. Some of the trees were sprayed only twice, namely May 19th and June 8th ; others four times, April 26th, May 19th, June 8th and June 22nd ; and yet others six times, April 26th, May 19th, June 8th and 22nd, July 13th and August 1st. On April 26th the buds were swollen almost ready to burst, on May 19th a few blossoms still remained on the trees, on June 22nd the young apples were set. At this date Paris green was added to the Bordeaux mixture, and used in this and all subsequent sprayings. The proportion of Paris green was equivalent to one pound in two hundred and fifty-six gallons of water, or two and a half ounces to the forty gallons of Bordeaux mixture. The apples were gathered about the middle of September, the fruit from each tree piled by itself, and divided into three grades ; the first of entirely fancy fruit, only strictly first class apples put into it ; the second of symmetrical and even large apples of good color, if several, even small, spots could be found on their surfaces ; the third averaged as good as the ordinary barrelling apples of the country. From the trees sprayed only twice, 55 per cent. were first grade, 43 per cent. second, and 2 per cent. third ; with 11 per cent. wormy. It will be remembered that the trees sprayed only twice received their sprayings before the codling moth would have laid many, if any, eggs. The trees sprayed four times gave 53 per cent. first grade, 46 per cent. second, 1 per cent. third, with 6 per cent. wormy. Those sprayed six times yielded 76 per cent. first grade, 19 per cent. second and 5 per cent. third, with 4 per cent. wormy. The trees left without spraying, for the sake of comparison, gave 25 per cent. first grade, 56 per cent. second, 19 per cent. third, with 9 per cent. wormy. The gain from two sprayings was 120 per cent., from four was 112 per cent., from six 204 per cent. of strictly first-class fancy fruit. The apples were subsequently sold, consisting of 65 barrels, the buyer graded them thus : 59 barrels firsts, 4½ seconds and 1½ thirds ; that is, he made 91 per cent firsts, 7 per cent. seconds and 2 per cent. thirds ; whereas Mr. Lodeman makes his highest percentage of firsts only 76 per cent., which was from the six sprayings ; while the average of the whole, the two, the four and the six sprayings, is 61.3 per cent. The difference between this and 91 per cent., as graded by the buyer, indicates the high standard of Mr. Lodeman's grading.

The small size of many of the farm orchards and the multiplicity of varieties of which most of these are composed, together with the pressure of other farm work in spring, may make the spraying of orchards seem an added burden too great to be taken up for the amount of gain. This, however, might be overcome by a number of farmers who live contiguous to each other combining for this purpose, uniting in the purchase of the requisite outfit, and engaging a competent person to prepare the material, do the spraying, and care for the machinery. The amount of liquid required to efficiently spray an orchard of large apple trees will average about four gallons per tree ; less will not be sufficient to cover all

parts of the tree properly, if more is used the excess will fall to the ground. Two men, one to drive and do the spraying, the other to work the pump, can thoroughly spray at least one hundred such trees in a day.

Again, most farmers wait for a buyer to come and take the fruit at such price as he may think best to offer. This man expects to make a profit sufficient to pay for his time and expenses; the wholesale dealer to whom he ships must have his commission, and if sent to Great Britain the consignee there has his commission. Why not unite also in shipping the fruit direct to the market and thereby save to the producer the profits of at least the travelling buyer.

In closing this paper the writer desires to impress upon the farmers the importance, nay, the absolute necessity of spraying their apple orchards every spring. The apple scab and the codling worm have been allowed to go unchecked so long that there is not an orchard in the country that is not suffering from the injuries inflicted by these pests. While we were ignorant of the means of preventing these injuries there was no help for it, but now there is no excuse for us if we allow these to continue. It is not only that the apple-scab fungus spoils the apples, but by its great injury to the leaves weakens the trees, so that the fruit which escapes being scabby, does not attain its full size. Nor is the codling worm the only insect injurious to the orchard that the spraying kills. The tussock moth, the yellow-necked and red-humped caterpillars, the canker-worms, the leaf-roller, the leaf-folded, the leaf-crumpler, the very small but very injurious eye-spotted bud-moth, the Palmerworm and others that might be named, are usually on hand to add their quota of harm. If we are to secure first-class prices for our apples, we must grow first-class fruit and there is nothing more certain than the fact that we cannot gather first-class fruit if we do not spray our apple orchards every season.

FIRES ON THE FARM.

From the "Monetary Times," Toronto, Ont.

Mr. Wilkie, the retiring president of the Toronto Board of Trade, rendered a public service the other day by calling attention to the economic importance of Health on the Farm. He might well have added a paragraph on the importance to the farmer of lessening the fire waste. The losses of insurance underwriters on farm risks have led some companies to withdraw from writing such risks. And we have seen, not long ago, a conservative company like the Agricultural of Watertown, increase its rates by reason of the excessive losses of recent years in this direction. Again, the experience of Ontario Mutuals, which do principally a farm business, goes to show that there is a serious annual loss of property by fire on the farm that might be greatly reduced if proper care were taken.

In the last report of the Ontario Inspector of Insurance we find a table in which are classified the causes of 1,481 fires reported by mutual fire insurance companies in 1892, causing an insurance loss of about half a million. No less than one fourth of these fires have arisen from such preventable causes as defective chimneys and flues, sparks, matches, lamps and lanterns, stoves and pipes, spontaneous combustion. Three hundred and sixty fires are put down to these causes, while incendiarism accounts for ninety five and lightning for between four and five hundred. Reports of inspectors of individual companies teach a very similar lesson.

The farmer and his household need to be taught greater care in matters connected with fire and fire places, or with combustible material in house and barn. Defective chimneys and flues have caused, according to this list, just as many fires as stoves and pipes, that is eighty-eight each, twelve per cent. in all. And next to incendiarism and lightning, these two are the most prolific causes of fires on the farm. Rank carelessness is indicated in a great many of these instances, as well as in the use of lanterns, matches or lamps. Seventy-three fires, or five in every hundred, were caused by lamps or lanterns. And besides, of the 320 cases in the list in which the cause of fire is "not stated" or "not known," we feel sure that a large proportion may rightly be put down to stove-pipes, chimneys or lamps.

July, August and September are the months in which farm fires were most numerous. This suggests the danger of summer kitchens, which are in many cases lean-to sheds, with their stove-pipes stuck through a wooden roof. A disc of zinc, with a hole cut in it to let the stove-pipe through, may be placed on the board or shingle roof; but this is not so much intended as a preventive of fire as a scheme to keep out the rain. The idea that any screen is needed to keep sparks from coming out of the pipe and setting fire to the roof does not seem to occur to the average mind. Chimneys are often badly built, and flues shamefully ramshackle. Stoves are put dangerously near woodwork; pipes, which often become red hot, or rusted into holes, are run through unprotected wood partitions with the most stupid defiance of the laws of combustion. Ashes are kept in wooden boxes; oiled rags are allowed to lie in forgotten corners; the chance of fire from sparks out of chimney, or stove-pipe falling on dry shingles or on the pile of wooden chips in the backyard, is looked upon as a matter of no consequence instead of being guarded against as a grave danger; imperfect lanterns are used in the barn, too.

We say again that the farmer and his household should be taught that it would be money in pocket to look prudently after the risks of fire. Such causes as bush fires, the friction of machinery, tramps, threshers, locomotives, all put together, caused only 1½ per cent. of the 1,481 farm fires of 1892, while the preventable causes we have named above occasioned twenty-four per cent. of them. Applying this by way of a sum in arithmetic, the proportion of loss from preventable causes cost the farmers of Ontario last year $120,008, where those from pure accident cost them less than $7,000. The subject is one which we should be glad to see farmers' associations take up and discuss.

BEE-KEEPING FOR TOWNS, VILLAGES AND COUNTRY.

By R. F. Holtermann, Brantford, Ont.

Time was when the question of dairying was considered of no great interest to the country and the agricultural classes. The advocates of dairying often spoke to those who would have been fortunate had they at an earlier stage inclined their ears and their understanding to this subject, which has at last been recognized as one of the most important branches of Canadian agriculture. Had the dairying question been taken up earlier many a farmer would have saved himself from financial ruin, and it would have improved the general condition of the country.

The advocates of bee-keeping stand to-day in a somewhat similar position to that in which the advocates of dairying were placed years ago; by that I mean although bee-keeping is engaged in with greater or less care to a greater or less extent, it is as yet in its infancy—in its infancy as to what is as yet known about the honey-bee; in its infancy as to the best methods of handling them winter and summer; in its infancy as to the best bee-keeping appliances. We have very little data as to experimentation such as you have in every other branch of the farm, as the governments of this country and of most countries have as yet done but little for the bee-keeper. Ontario, I venture to say, ladies and gentlemen, is not only in its infancy as to these, but it is in its infancy as to the extent of its development, as to the amount of wealth it can produce from year to year in one province, and as to the employment and means of livelihood it will find for the sons and daughters of Canadians, and especially Canadian farmers.

Bee-keeping has so many advantages in a province such as ours that it will well bear the light of close study and thought from careful and well developed minds.

Before setting forth its advantages let me warn you against those who would lead you to believe that any one can engage in the bee-keeping industry, and do so without experience, study and time—that the bees have but to be purchased, and a convenient, and perhaps an out of the-way place found for them to stand, and they gather the honey which has but to be taken from the hive. I was under an impression something like this myself before I engaged in the business. Unfortunately sanguine minds, anxious to develop the business, set forth that side of the question too much. Such men exist

to-day, and I would warn you against them. Such doctrine, instead of developing the industry, has led many to engage in it without being on their guard against the pitfalls which are to be found in every calling, and, as a result, a large number have failed to make bee-keeping pay who might otherwise have succeeded, and it has been a loss to the province and to our Dominion of thousands and hundreds of thousands of dollars. Bee-keeping requires attention, and it requires study and intelligence. If there is any calling which does not, it is unworthy of the attention of thoughtful minds, of industrious men and women.

And now, after having spoken of that which must be guarded against, and impressed upon you what some may call its disadvantages, let me set forth a few of the advantages to be derived from the keeping of bees. Bee-keeping displaces no other crop upon the farm. The bees take advantage of the natural flora within a radius of two, three, or even, in rare instances, four or five miles of their home. Aside from the ground they stand on they take up no room, and not only do they displace no other crop, but they assist beyond a doubt very materially, through distributing pollen, in increasing the quantity and quality of the fruit crop and the alsike clover seed crop.

Bees in gathering honey which has as its constituents those elements which the plant takes from the atmosphere, take nothing from the fertility of the soil. The only crop upon the farm which can say this is butter, and in this latter case only when every particle of butter milk has been washed from it.

Again, many a son or daughter in a household, particularly the farmer's household, does not see a way to purchase a farm, or an opening at home, and the result is they leave the home. Bee-keeping requires no great capital, and fifty to one hundred colonies could by many be kept to advantage, and although needing close attention during the busy season they do not require all one person's time by any means.

One hundred colonies of bees properly handled, in the greater part of the province, although but a small financial investment, will, one year with another, produce more than the average farm is producing to-day.

There are many minor advantages; honey produced for home and table use alone is no mean advantage. This is a product recognized not only during the present age but during all ages from which we have any literature, to be one of the most valuable of foods. In ancient times the reason was not as well known as to-day; men judged from results. To-day we know that our flowers distil healing and healthful essential oils; that the bee in her slow process of gathering and storing adds to it the secretion of certain glands which passes the nectar, later honey, through the first stages of digestion, and renders it almost ready for assimilation by the system; hence its value as a food unless in cases where sweets of any kind are injurious. Many a dollar that is spent for sugar could be saved by substituting honey.

Owing to the improved appliances and better methods of keeping bees the cost of honey has been so reduced that although a luxury in the sense that it is delicious and pleasing to the taste, its cost upon the market, and its richly nutritive properties, have brought it within the reach of the humble homes of our land.

THE DAIRY HERD.

By G. E. Day, O. A. C., Guelph, Ont.

The controversy as to which is the most profitable dairy breed is one that is not likely to be settled for a long time yet, if indeed it is ever settled. In discussing this question we are apt to lose sight of the fact that conditions and treatment have a great deal to do in determining the value of a breed; and while one man may find a certain breed adapted to his condition and treatment, the experience of another man may be quite the reverse. When a stockman secures a breed of cattle that thrives particularly well under his care, he naturally concludes that he has the best breed of cattle; and no doubt he has, so far as he is concerned, but that does not prove that the same breed would be the best for every other stock breeder.

Then again the question is still further complicated by a dispute as to whether a general purpose or special purpose animal should be selected; and here again conditions may alter practice. The man who is situated in a district where beef brings a fair price feels disposed to pay more or less attention to the beef side of the question, and in many cases finds such a course profitable; while, on the other hand, the man who is situated where beef is of comparatively little value, finds it to his advantage to direct all his efforts towards developing milk qualities.

The breeders of pure bred dairy stock are doing a great and useful work, but the inexperienced may find it a costly experiment to invest largely in high priced animals; for, owing to his inexperience, his mistakes will likely be many, and owing to the high value of the animals, his mistakes will frequently prove costly. The beginner will usually finds it to his advantage to make the best use of what he has; but as experience widens and opportunities offer he may see his way clear to enlarge his operations, and in the course of time he may gather together a herd of animals that will command fancy prices. If he has to purchase his stock of cows with which to begin, he will find it safer to make individual merit the standard, rather than to pin his faith entirely to breed. But though he may not be over nice with regard to the breed of the cows of his selection, it is of prime importance that the sire used on this herd should be of good family and pure bred. The reason for this is obvious: the cow affects only one calf, but the sire affects the progeny of the whole herd. However much may be said in favor of the general purpose animal—and certainly a great deal can be said in its behalf—s ill the breeder who is earnestly striving to improve his dairy herd is naturally drifting towards specialization.

One thing is certain, no matter how careful the selection of animals, the breeder will find ample need of weeding. Those grand herds of various classes of stock that have made famous the names of their breeders, did not spring into existence in a year or two; and every man who aspires to be a breeder must be prepared to meet many disappointments and to see many of his efforts result in nothing before he attains success. Failure to appreciate the necessity of a higher standard is one of the weak points in Canadian dairying. We are too prone to look to the number of cows in our herds rather than to their quality, and when returns are small we are inclined to place the blame almost everywhere but where it properly belongs. If every dairyman knew exactly what each of his cows produced in a year, there is no doubt that many cows would be found that could not be made to pay for their keep. Such being the case, it is little wonder that many patrons of cheese factories and creameries are disappointed with their returns. If we insist upon keeping these inferior animals, and fondly believe that every cow is nearly, if not quite, as good as any other cow, we may make up our minds to encounter hard times.

Too much stress cannot be laid upon the importance of knowing what each animal is producing, for this is the only method of detecting the dishonest ones. Judging the yield of milk by the eye is not a safe method, because half an inch or so of difference in the depth of milk in a pail is hardly noticeable, but even that much difference will count up wonderfully in the course of a year. A weighing apparatus of some description, if it be only a common spring balance, is a valuable and almost indispensable aid in the weeding process, while the operation of weighing will occupy a very short space of time.

But there is more than the weight of milk to be taken into consideration: we must know the quality as well. For determining the per cent. of fat in milk there is no easier and more reliable method than the Babcock milk tester. A few lessons from some one who has had experience with the machine will enable any person with average common sense to obtain satisfactory results. The cost of the machine is not large. From eight to ten dollars will buy one large enough for the purpose, and several farmers could use the same machine. One test is not sufficient to determine the value of the milk, for there is sometimes considerable difference in the fat content of two successive milkings, while the per cent. of fat always rises as the milk flow decreases. For these reasons it is well to test several successive milkings, and then take an average of the results. Three or four such tests made during the season at different periods of the milk flow will enable

one to form a very satisfactory estimate of the value of a cow when the weight of milk produced by her during the season is also known.

There is a difficulty to be faced just here, and that is the question of time. How is the farmer to find time for weighing and testing milk? As already intimated the time required is not great. It takes only a few minutes to do the weighing, and with a little practice it requires but a very short time to take the samples which may be put into the test bottles and set aside until a convenient time for completing the operation of testing. It is not so much the lack of time as it is the lack of inclination to take the trouble which prevents many from testing and keeping records of their cows.

But granting for the sake of argument that it requires considerable time to do this work, the fact still remains that dairying is a business, and he who would succeed must use business methods. There is no business in which a man can achieve the highest degree of success without giving it especial attention, and the dairyman who cannot afford to give his business that attention which it demands, has only himself to blame if results are not satisfactory. We are too apt to undertake more than we can do well; but under the pressure of hard times we are beginning to see the necessity of concentrating our efforts and of giving more attention to the cost of production. The problem of increasing the selling price of dairy products is certainly an important one; but the problem of reducing the cost of production is equally important and much more easily solved. Its solution lies within the power of every farmer, and requires simply intelligent, well-directed effort, based upon business principles.

HOW TO IMPROVE THE QUALITY OF OUR MUTTON.

By Henry Arkell, Teeswater, Ont.

As the Canadian farmer of necessity—from the unprofitable returns of grain growing, arising both from the low price obtained for the same, and, in many instances, from the exhausted state of the land from the continued cropping of cereals—is now turning his attention to the raising and fattening of live stock, both as a source of income and also as a means of again bringing back his land to that state of fertility which will enable him again to produce paying crops of cereals, and from the temporary depression in sheep husbandry, a word of encouragement in this direction may not be amiss.

I will first notice the increased consumption of mutton in the United States. A writer in the New York *Journal of Commerce* of December 5th, 1893, states that the consumption of mutton has steadily increased for the past six years, and the testimony of the wholesale butchers is that for the six years preceeding 1893, the consumption of mutton has doubled each year, and that the hotels and restaurants in New York and other large cities take equal quantities of mutton and beef; the butchers there also state that they have to depend on Canada for fine mutton. The United States are importing considerable quantities of mutton from South America which they say is of inferior quality, and eats sweet but dry; but, what is more astonishing, they state that the ocean steamers are bringing into New York, Irish and Scotch mutton to supply their best customers.

Now, I think the Canadian farmer can and should produce mutton equal, if not superior, to any in the world, and so command the highest market price for his product. This high quality of mutton can only be produced first, by having the right kind of an animal of the mutton breeds, and properly feeding the same with food that will produce that fine-grained, juicy meat which is now so much sought after by the consumer.

Now, with respect to the food to be used to produce the desired result, I unhesitatingly say we must use more roots, for if we remember that this high class of mutton is produced in England and Scotland where roots constitute nearly the sole diet of the fattening sheep with a small amount of clover hay, supplemented by half pound of grain and half pound of linseed or cotton cake daily, we must logically conclude that this high class of meat is largely due to the kind of food consumed by the animal.

The objection may be raised that we cannot feed roots to the same extent safely as do the English and Scotch farmers. Perhaps not in the very severe weather, but by careful and judicious feeding roots may and can enter largely into the diet of fattening sheep in this country. Again it may not be generally known that a large ration of grain fed daily to sheep, produces a hard eating meat not palatable to connoisseurs.

In conclusion I would say feed largely of turnips, the common varieties, till Christmas, then give Swedes with plenty of early cut, well saved clover hay, and not exceed one pound of grain daily, a mixture of oats, peas, and barley, two of the former and one each of the latter, or half pound of grain and half pound of linseed cake: and with a well bred animal of one of the mutton breeds, I make bold to say the Canadian farmer can successfully compete with any country in any market. I have, and may again, be met with the argument that grain is more easily handled and conveniently fed and will produce as good results. I emphatically say "No," we cannot produce that high quality of mutton unless we feed largely of roots, which in my humble opinion is the most economical food if we take into consideration the cost of production and the results obtained.

THE FARM HEN HOUSE AND HOW TO RUN IT WITH PROFIT.

By Capt. Geo. Farewell, Oshawa, Ont.

In this country, with its long and severe winters, its hot summers, and often rainy periods, the farm poultry need protection and shelter in a good building It need not be expensive, it need not be ornamental, it must be suitable for poultry and a place they like. It should be built on a dry foundation, as dampness in or around their quarters causes disease, precluding the possibility of the greatest egg production.

The house should face the south and be furnished with glass enough to make it well lighted, but it is not necessary to have the south side composed of all or nearly all glass. That is an expense which may be avoided with profit by the farmer. Two medium sized windows are sufficient for a building twenty feet in length. The studding of a winter poultry house should be boarded on the outside, the inside covered with tar paper and ceiled up with good planed and matched lumber. Two feet above the floor, on the north side, build a platform two and a half to three feet wide. Eight or ten inches above this platform place the roosting poles. The platform should be dusted over with dry road dirt, coal ashes or fine field earth. With the dirt will be mixed most of the droppings of the fowls, which should be often removed and stored away for use as a fertilizer for corn or other crops. Underneath the platform place the nest boxes in such a way that the hens must enter them from behind to lay. An opening in front, through which the eggs are gathered, should be covered; the object being to seclude the hen as much as possible while depositing her egg.

Provide a dust bath by putting in a low box, of good length and breadth, partially filled with dry road dirt, coal ashes or fine field dirt—road dirt is the best. Into this bath sometimes throw a pan of wood ashes just as they are taken from the kitchen stove, the more charcoal they contain the better. I was induced to try this experiment by the trial made at the Wisconsin Station of feeding wood ashes to pigs, effecting a great saving of feed as well as insuring good health to the swine. Wood ashes in small quantities, placed in the dust bath, I found to answer nicely. Used in this way they assist greatly in digestion, particularly when much corn is fed; they are a potent vermin killer; they are a saver of feed and helpful to the fowls in the line of health. Wood ashes must never be used anywhere else in the hennery, nor even allowed to come in contact with the droppings, as the ammonia the voidings contain will be released and the health of the fowl endangered, as well as a serious loss of manure incurred.

That hen manure is valuable no one will deny. I have used it on corn and found little difference between it and commercial fertilizer used for the like purpose. Before putting in the corn hills it was pounded fine on the barn floor and thoroughly mixed with an equal amount of dry road dirt. This mixture is a good forcer of vegetation.

The average of three experiments with hens at Cornell University, to ascertain the composition and the value of the voidings, gave the following: nitrogen, 2.88 per cent.; phosphoric acid, .83 per cent.; potash, .68 per cent. Allowing fifteen cents per pound for the nitrogen, six cents per pound for the phosphoric acid and four cents per pound for the potash, they found a total value of $10.07 per ton. No farmer should let this manure go to waste by getting wet. When removed it should be stored away where it will be perfectly dry until used. The dust bath should be cleaned out occasionally and the contents thrown out on the garden or orchard.

Nail a small box to the side of the house a few inches above the floor, in which keep crockery and bones pounded fine. If you have a bone mill you can grind broken crockery and bones. Even pieces of glass ground fine may be mixed in at times with no bad effects. This is a kind of grit much approved of by the hen, and assists to keep her in condition for laying.

Dry bran may be kept before them at all times in winter with profit. Nail the box containing it to the side above the floor.

Keep a bundle of clover hay, suspended about a foot and a half above the floor, for green food. Feed turnips, cabbages and potatoes with plenty of meat if you desire eggs in the winter.

In summer hens should have unlimited range in the orchard or berry garden. Sow the range with buckwheat and leave the crop for them to harvest. By so doing the chicks will fatten up for early fall market, the best time to sell. The old hens, now in good condition too, may be profitably sold.

My way of conducting the business for profit is to raise all the chicks possible by using hens for incubators. May and June chicks I have found to pay better than those coming earlier or later; the weather at this time is favorable to the rapid growth of young chicks.

Provide a room for setters alone; have a dust bath there. Keep water by them fresh at all times, feed them plenty of corn and some fresh meat. Use pyrethrum or insect powder liberally on the setters. Keep everything in the setting room perfectly clean and neat.

Set several hens at the same time. For example, say we set three hens on the fifteenth of April, the chicks will be due May the sixth. Let us give all the chicks to one hen, and give the other two hens more eggs to hatch. The chicks of the second setting will be due May 27th.

Take the chicks away from both these hens and give them to one set for the first time on the last mentioned date. She will be more able to mother the chicks than those which have been busy setting for six weeks. Break up the long setters, feed them liberally on wheat and they will soon lay again.

The profit arising from this management may vary considerably, much depending on the weather, care and feed. These figures are within the mark, giving credit to each hen of sixteen chicks at two sittings, worth in the early fall market at least twenty-five cents a piece, equal to four dollars per hen per year. This is not all the earnings, for she would lay quite a number of eggs besides those she manufactured into chicks, but as there might be some loss in growing the chicks to market size we might reasonably offset that loss by not counting the eggs. The cost of feeding poultry per head for a year is about one dollar. This will provide a ration liberal enough to give winter eggs, other things being equal. Farm poultry are the smallest stock usually kept by the farmer for profit, yet they pay a larger percentage of profit in proportion to their value than any other stock, when handled with skill and care.

The farm hen house should be considered a manufacturing establishment for the production of meat from the manufactured article, eggs. It is only in this way that poultry can be made to pay a large profit. The profit usually derived from the sale of eggs is moderate. The farmer who would sell eggs for gain should preserve them by liming or some other way when cheap, and hold them until the highest price can be obtained. Pursuing such a course his fowls may make for him from fifty cents to one dollar per head. Feed on the farm is cheap, for much that the poultry get costs nothing, particularly in

summer. The profits always will be in proportion to the cost of the feed, the care of stock and the kind of poultry raised.

Light Brahmas and Wyandotte thoroughbreds, are good on the farm. They are good layers, good mothers, of good weight and very toothsome when dressed and properly cooked. There are other kinds just as good as these mentioned.

When selecting a breed to start with, the beginner ought to be reasonably sure that his birds possess qualities that attract in the market as dressed poultry. Whatever care is given poultry they must never go a day without fresh water. Give them fresh gravel and old plastering; feed meat or meat scraps in winter.

Milk sweet or sour is good for egg production. Milk should be boiled, as it agrees with the hens better than raw. I have tried many ways of watering this kind of stock, and feeding them milk, of which we have a plentiful supply on the farm. I found the best way was to use an iron pot, rather low but large enough to hold a pail of water. Take a box sixteen or eighteen inches high, turn it bottom up on the floor; set the water pot on this. When you have milk to feed the kettle is always ready to boil it in. The box must be of sufficient size to permit quite a number of hens to stand on as they drink from the kettle. They seldom dirty their drink.

Gather the eggs often, as hens may learn to eat them. It is a good plan to keep artificial eggs scattered around on the hen house floor. The hens will try to eat them, and failing, will learn to leave the real ones alone.

Allow no more than fifteen or twenty hens in one apartment. Poultry in small lots pay better than in large numbers.

If common hens are to be used, mate the best layers with a thoroughbred male bird. In this way will the stock be improved and greater profits obtained.

The annual poultry products of the United States are valued at $300,000,000, or about $5 per head of the population of that country.

The immense quantity of eggs and poultry represented by this large sum of money is all consumed by the American people. This does not satisfy Uncle Sam's voracious appetite, as according to statistics he imports from Canada, even under the McKinley tariff, eggs and poultry in value nearly $2,000,000.

The value of poultry products for the Province of Ontario, year 1892, is about $3,000,000, equal to about $1.50 per head of the population of that province.

There are about 300,000 farmers and others keeping poultry in the Province of Ontario. If each farmer would make out of his poultry $50 a year besides what he used in his own family, it would lift our poultry industry into one of importance—$15,000,000. "'Tis a consummation devoutly to be wished."

LAND DRAINAGE.

By John MacMillan, M.P., Constance, Ont.

In this age of keen competition and low prices farmers can do little in the way of regulating the price of farm products, but a good deal can be done by reducing the cost of production and improving the quality of the goods produced. In order to cheapen production three things are necessary: Thorough drainage, a plentiful supply of farmyard manure, and thorough tillage of the soil. The first place must be given to drainage, because it must precede all other methods of improvement. Some people will still assert that to drain heavy clay soil is to injure it and make it produce less, and to any person unacquainted with the principles of drainage and its effects upon the soil it may appear inconsistent to say that land well drained is dryer in wet weather and more moist in dry weather, which all experience proves to be the condition of a well drained piece of land. Many people are of the opinion that the main object in draining is to get the water out of the land, but I think the main object is to get the water into the land, as more water passes through a drained than through an undrained soil. On an undrained field a quantity of the rain finds its way into ditches and part is evaporated and goes off into the air; whereas in a drained field the greater part of the rain passes into the land and

what is not required passes out into the drains. When in undrained land the water becomes stagnant, fills all the pores of the soil and keeps the land cold, as the heat that would penetrate the soil is absorbed in evaporating the water that is near and on the surface. Tests have been made with thermometers to show the difference in temperature between drained and undrained land, with the result that at a depth of seven inches from the surface in a field of red moss the temperature of 10° F. was gained in drained land compared with the undrained land in the same field.

In drained land the water that is in the land is in a state of motion, so that the land contracts when dry and expands when wet. Thus a continual state of pulverization goes on in a well drained soil. Then when water freely sinks through the soil air must follow, which assists the decay of vegetable matter in the soil, thus preparing it for plant food. Some of the benefits due to drainage are: First, it lengthens the season, as one can get earlier on to the land in the spring and can cultivate later in the fall; it dries more rapidly after heavy rains during the summer.

By the aid of drainage the farmer can get an earlier harvest, which is a great advantage. A more abundant crop of almost all kinds, especially in peas and corn—peas for meal and corn for the silo. In many fields drainage will give one-quarter more corn than where the land is undrained. Then the produce is of a better quality and not so subject to rust and blights.

A greater variety of crops can be grown and we are surer of a good catch of clover on a well drained soil, and it is not so apt to be thrown out with the frost in winter and spring.

The tillage is rendered much easier, especially on heavy clay soils, as nothing is more injurious to clay soil than to work it in a wet condition. Drained land dries much more rapidly than undrained land, as there is less time lost in waiting after rain until the land is fit to cultivate.

Then the application of manure is more effective. There is no greater mistake made by farmers than that of applying fertilizers, in any form, to wet land. And this is one of the best reasons for insisting upon thorough draining, as the first step towards improvement in our system of farming.

The health of live stock on the farm is much improved. The health of the farmer and family is also improved, and their is greater comfort in all farm operations.

In beginning to drain a field attention must be paid as to whether the wet condition of the land is due to surface water, or to springs which frequently do not reach the surface, or to water coming from higher lands and coming to the surface, when it comes to or near the level of lower land. In draining I have found that our low land is generally easier drained than our high land as it is mostly of a more porous subsoil, and hence drains will draw a greater distance. In some of our land there is what may be termed dykes; they are impervious to water, from four or five feet wide, to eighteen inches and in some instances come nearer the surface. In cutting a drain through such a dyke I have seen water taken six and eight rods in a very short time where the bottom was porous all except the streaks of hard substance.

The first and very important condition of draining is to find a proper outlet which should be perhaps one foot deeper than the small drains which are to be put in. Avoid, if possible, all open ditches on a farm for leading drains; if a six-inch tile will take the water do not leave an open ditch. Where an open ditch must be made give plenty of slope to the sides of the ditch, as if the sides are steep they will keep coming in and filling up the watercourse. Leading drains should have a fall of six inches into a ditch if possible. To get enough of fall these small drains or laterals should have a drop of at least three inches into the leading drains.

Have as few openings as possible into an open ditch and these secured if possible with one flat stone below and another on top of the end tile. Where the laterals enter the main drain always turn a little so that the flow of water when it enters the main is in the direction of the flow in the leading drain.

About the depth and distance apart that depends entirely upon the nature of the soil. Some writers affirm that no drains should be made of less depth than

three or three and one half feet deep, but I find in very heavy clay that greater advantage is got by putting drains in only two feet deep. Some think this is too shallow—that the tile will be injured and heaved up by the action of the frost. Drained land is porous and not subject to be heaved to the same extent as land that is full of water, as evidenced by the throwing out of clover roots in undrained land, when they are not thrown out where there is a drain.

I have very heavy clay soil on two farms. The drains are only two feet deep, and I have never known of any injury to drains from the effects of frost. But upon this everyone must be the judge for himself of the depth and distance apart of drains, and must be guided by the quantity of soil to be drained and other conditions of his own situation.

In draining be very particular as to levelling the bottom of the drains. On level land the fall should be at least one foot in 200, which will work if properly put in. One of the difficulties to one not accustomed is to get the tile properly placed and protected in going through quicksand. If the surface is muck, clay or clay loam put it to one side and put the sand to the other side, dig the drain three inches deeper than the tile is to be laid, then tramp three inches of the surface soil solid and level to lay the tile on, then pack all around and say three inches on the top of the tile with the surface soil and tramp it, then fill in. Another way is to take saw dust if near a saw mill and tramp two or three inches to lay the tile on, pack around and on the top of the tile with saw dust. This is largely practiced in the counties of Elgin and Kent and is said to be very successful in draining where troubled with quicksand. In very heavy clay always pack around the tile with the surface soil, never put the clay subsoil around the tile, as the surface soil is porous only. Tramp sufficient to make firm around the tile in clay land, but not to pack solid or puddle, which would prevent the water from reaching the tile. Always see to it that proper draining spades and scoops to follow are used for taking out the bottom of the drains.

As to the cost of draining, this depends upon the quality of the soil, if easy or hard to dig, upon the price of tile and the distance they have to be drawn, etc.

Cost of Draining in 1893.

Prices of tile at tile works 2½ inch bore, per M	$ 8 50
" " " 3 " "	10 00
" " " 4 " "	17 00
" " " 6 " "	32 00

Cost when laid in the field as they were put on the train and we had to draw six miles from railway station home: 2½-inch $11, 3-inch $14, and 6-inch $40 per thousand.

Cost of draining 2½ feet deep on clay soil, digging	$ 12½
Cost of tiles per rod laid down at drain, 3-inch tile	22½
Putting in tile and filling	4
Board per rod	4
	43

Cost of 6-inch tile drain, say 2 feet 9 inches deep:

Digging, per rod	$ 15
Cost of tile laid down at drain	64
Putting in tile and filling	6
Board per rod	5
Cost per rod of a drain 2 feet 9 inches deep and 6-inch tile	90

I would never let draining at so much per rod for the contractor to put in the tile and fill the drains. We put in all the tile ourselves and after the tile in the bottom is packed we fill with the plow and team.

A farmer with boys of his own can drain cheaper by taking off the surface with the plow, then taking off the mould board and taking out the coulter and running through the second furrow and shovelling it out, thus leaving only say fifteen or sixteen inches to dig out in a two and one-half foot deep drain.

In very wet land I think I am save in saying that draining will pay in four crops, on account of the increased yield of grain or roots, the saving of time in working the land and the time spent every time the crop is put in making furrows to carry off the water from the surface.

THE RELATION OF PATRONS TO CHEESE AND BUTTER-MAKERS.

By J. W. Steinhoff, Sebringville, Ont.

This subject in many of its bearings is a very sensitive one, and I am not sure that I can handle it so skillfully that I may not infringe upon someone's corns; but I can assure the reader that there are no personalities meant, and I shall endeavor to discuss this subject in a fair and impartial manner.

At the beginning I take the ground that the patrons who supply the milk, and the cheese or butter-maker who manufactures it are all brethren, and does it not become brethren to "dwell together in unity." Their interest and their objects are one and the ultimate goal aimed at is one. Therefore when confidence by any means whatever is destroyed that maker's usefulness in that particular locality is to more or less extent at an end. The patron cannot succeed in the business without the help of the manufacturer, and *vice versa*. Patrons of cheese factories, you alone never made the reputation for Canadian cheese. Cheese-makers, proud as you are of the position your manufacture holds in the markets of the world, you never made this reputation yourselves. You had first to have a first class article of milk from which to make it, and for this you are dependent upon the patrons.

Then it is very important that each should enjoy the trust and confidence of the other. A cheese-maker cannot afford to be ignorant of the methods adopted by his patrons of feeding and caring for the cows nor of treating the milk after it is drawn. Neither can patrons afford to allow their milk to go to the factory and be manufactured in a haphazard, slovenly kind of way, making it necessary that it should be sold at a sacrifice, or else the reputation of the factory is in danger.

Cheese and butter-makers as a rule are entirely dependent upon this one branch for their living and welfare, not only for themselves but that of their families. On the other hand patrons too often consider when they are sending their milk to a factory that they are doing that maker or proprietor a great favor, and consequently are expecting especial favors in return; and it is simply impossible for a factory manager to give any favors upon a fair and equitable basis. I think there is also a tendency to be careless as to the care of their milk by patrons, who think they are doing a favor in sending their milk to the factory, and they are much more easily offended if anything is said to put them right in case they are making errors.

As I have before intimated, cheese and butter-makers should be well versed in all phases of the dairy question, not only in making cheese and butter, but in selecting, breeding and feeding cows and also in caring for the milk after it is drawn, and in this way be capable of giving good advice upon these points; and I think a man who undertakes to run a cheese or butter factory, being entirely dependent upon it for his prosperity, will exert himself to be well posted and able to give good instruction.

Patrons should be willing to consult with and receive advice from their makers and apply it so far as is consistent with good sense and judgment. But in many cases we find that patrons seem more willing to receive and act upon almost anything they read or hear upon this subject from any other source rather than from the man with whom they are doing business every day. In fact many seem to be looking for differences and opinions that are contrary to what is taught and practiced in their own factory. I beg to say this is not as it should be. Unless the proprietor or maker is altogether unworthy of the confidence of the patrons, do not give credence to every story that is afloat which does not harmonize with the teachings at your own factory. "Prove all things, hold fast that which is good." On the other hand we often find managers of factories who are continually extolling the merits of their best patrons and comparing their returns with that of those who are not doing so well, and I think this is a mistake, as it has a tendency to discourage and disgust those who are getting the small returns. Care should be exercised to only draw the comparison when it is necessary to show what can be done with good cows rightly managed.

Again, the welfare of cheese and butter-makers is dependent upon the welfare and prosperity of each of their patrons, and it is greatly in their interest to see that

patrons get the greatest possible return for their milk, otherwise they will become dissatisfied and as a consequence will send less milk and this means a loss to the factory-man. Both are directly dependent upon the reputation of their own particular factory and also upon the reputation of Canadian cheese in general. Now the cheese or butter-makers often make discoveries in the milk when it arrives at the factory which are not apt to be noticed at the farm. For instance quite frequently when emptying the milk into the weighing can from the wagon there is a dark streak of milk at the bottom, showing to the expert cheese-maker that the milk has not been properly strained through a double thickness of cheese cotton, as many persons think that a wire strainer will take out the fine dust and hair, a certain amount of which will get into the pail during the process of milking, let us be ever so careful. Is it not then the most reasonable and common-sense thing, in the interest of the person sending such milk, in the interest of the maker himself and in the general interest of Canadian dairying, for the maker to go directly to the person sending such milk and inform him of its condition and suggest a remedy, for as stated above in the ordinary way of handling milk in pails at home, this fine dirt may not be noticed, and if allowed to stay in until it reaches the factory a certain amount has become in solution and cannot be separated.

The same may be applied to the various obnoxious flavors that milk is so liable to, and which are so detrimental to the finished article of cheese; they may be scarcely perceptible at home and yet capable of doing great damage after reaching the factory. It is a fact, even yet, that a large number of patrons have the idea that their milk should never be returned from the factory unless it is sour or even thick; but a cowy or other foul flavor is much more damaging than a can of sour milk, so long as it is not thick. The only effect the sour milk will have upon the contents of the vat is to hasten the process of manufacture but twenty-five pounds of tainted milk will contaminate a whole vat, and the influence cannot be fully overcome in any way it may be handled.

Then concerning cheese-makers' wages, I believe there are a good many erroneous ideas, many patrons thinking that they are too high and that cheese-makers are making too much money, having a better return at the end of the year than the patrons themselves who have the capital invested in the farms, stock, and implements. I think this is due in many cases to the fact that cheese and butter-makers often dress better and have more "get up" about them than a certain class of farmers, but this is not the slightest indication that such persons are making money. I think if there is any class of the community who should keep themselves neat, clean and attractive looking by decent dress it is the cheese and butter-makers both at home and abroad. I am free to confess that cheese-makers may enjoy the privilege of having more money about them during the summer season than the farmer as they are paid every month; but just go on to the end of the year or until the time of starting the factory again in the spring and the majority of cheese-makers are but very little better off than when they began the year before. I was surprised upon inquiry at the number of makers who have accounts carried over from year to year by the dealers who are furnishing the supplies.

Farther than that it is nearly all young men with small families who are now engaged in the business and managing the factories in Canada, and I have a solemn impression that where the families may increase to six or eight in number, that this occupation will have to be abandoned for there is not sufficient remuneration from even the best factories at present prices to properly clothe and educate those committed to our care. Another reason why there should be no such envious dissensions as sometimes exist on this point is that in many cases the men who are hired at the lowest prices are actually the dearest to the patrons in the end. I could name a number of factories where there have been law suits and any amount of trouble simply on account of hiring a cheap cheese-maker in the first place; he in turn hired cheap help and cheap material, and a cheap article was the result. Now the difference in the prices paid to different cheese-makers is not very much it is true—perhaps in most cases not more than five cents per hundred pounds—but even this small amount means an encouragement to the maker, and is a stimulus to any right thinking man to do his best and use only the best material. It gives the maker to know that his services are appreciated, puts him upon his mettle and prompts him to throw all his energy into the business.

And again, the best cheese-makers are about sure to make the quality of cheese that is sought after by our buyers, no matter what factory they are in, and will in this way enable their patrons to realize at least a quarter of a cent per pound more for their cheese than many surrounding factories. Well, a quarter of a cent per pound upon only one month's cheese will compensate the patrons for the extra five cents per pound paid to the cheese-maker. Therefore, even in this matter, the utmost confidence and good feeling should prevail, for the prosperity of the one is a sort of guarantee of the prosperity of the other.

Another very important point is the way cheese are too often boxed, not being shaved down to fit the cheese. This work is now mostly under the charge of the cheese-makers throughout Canada, and I think the managers of factories and patrons should insist upon this work being properly done and their cheese sent out in the best of order. On the other hand, we often find the patrons of factories urging upon their managers to ship the cheese as early as possible and let them have the money for it; as a result cheese are often shipped too green. Such a policy is short-sighted and ruinous to the best interest of Canadian dairymen, and I venture to say that if the maker should send to the patrons who are so anxious for early shipment, cheese for private use as green as they are sometimes placed on board the cars they would be sent back to the factory. More especially is this true of the fall cheese.

Then let us unite in an honest effort to promote the true welfare of our own particular factory and Canadian dairying in general, and in so doing we will be found to be adding to each others prosperity and the happiness of all.

THE HORSE'S FOOT.

By J. Massie, V. S., Kingston.

In a description of the foot of the horse it is customary to include only the hoof and its contents, yet from a zoological standpoint, the foot includes all the leg from the knee and the hock down.

The foot of the horse is undoubtedly the most important part of the animal, in so far as veterinary surgery is concerned, for the reason that this member is subject to so many injuries and diseases, which, in part or in whole render the patient unfit for the labor demanded of him.

The old aphorism "no foot no horse" is as true to-day as when first expressed; in fact, domestication, coupled with the multiplied uses to which the animal is put, and the constant reproduction of hereditary defects and tendencies, have largely transformed the ancient "companions of the wind" into a very common piece of machinery which is often out of repair, and at best, is but short lived in its usefulness.

Since the value of the horse depends largely, or even entirely, on his ability to labor, it is essential that his organs of locomotion should be sound and be kept sound, and to accomplish this end it is necessary, not only to know how to cure all diseases to which these organs are liable, but, better still, how to prevent them.

An important prerequisite to the detection and cure of disease is a knowledge of the construction and function of the parts which may be involved in the diseased process. Hence, first of all, the anatomical structures must be understood.

The bones of the fetlock and foot constitute the foundation on which the other structures are built and comprize the lower end of the cannon bone, the two sesamoids, the large and small pastern bones, the navicular and pedal or coffin bone, the lowest bone of the foot.

The cannon bone extends from the knee to the upper end of the larger pastern bone, is cylindrical in shape and stands nearly or quite perpendicular.

The sesamoids occur in pairs, are small three sided bones, placed behind the upper end of the large pastern or suffraginis.

The oss suffraginis is the large bone of the fetlock proper, and runs in an oblique direction from the lower end of the cannon bone to the smaller pastern or corona just above where it enters the hoof.

The corona or smaller pastern bone is a very compact, nearly square bone, which is partly enclosed by the hoof, and rests upon the lowest bone of the structure, viz., the coffin or pedal bone.

The coffin bone is situated within the hoof, and is somewhat pyramidal in shape on its front aspect, somewhat hollowed out posteriorly and conforms to the shape of the hoof somewhat.

The navicular bone is an elongated small bone lying across at the back of the joint formed by the pedal and coronary bones, and serves as a lever over which the tendon passes which flexes the foot and lower part of limb.

All of these bones are covered where they come into contact with each other with cartilage of incrustation, forming a bright porcelaneous covering which makes articulation less liable to cause friction, and the substance itself is so hard and dense that no perceptible wear takes place, the portions of bone between or not entering into the articulations are covered with a vascular fibrous membrane called the periosteum.

The joints are of essential importance, since any interference with their functions very seriously impairs the value of the animal for most purposes. As the joints of the foot and pastern are the ones most subjected to concussion and strain they are the ones most subject to injury and disease. The joints of the foot may be considered as the fetlock, pastern, and coffin. They are made up of two or more bones finely fitted to each other and are held in position by strong bands of ligament and lubricated by a fluid secreted by a membrane surrounding the ends of the bones; this fluid is called synovia and is present in all gliding or hinge joints.

The fetlock joint is made up by the union of the lower end of the cannon and upper end of the large pastern bone, together with the two sesamoids; this joint admits of very extensive motion.

The suspensory ligament of the fetlock, is a strong band starting from the knee extending down the back of the cannon bone until near the fetlock where it divides and sends a branch on either side of the joint downward and forward, and becomes attached on the sides of the extensor tendon at the lower end of the pastern bone.

The pastern joint is made up of the union of the two pastern bones.

The coffin joint is made by the union of the lower end of the lower pastern bone with the coffin and navicular bones.

Three tendons serve to move the bones of the foot one on another. Two of these flex or bend the joint while the other straightens it; they are called the flexors and extensor tendons.

The flexor pedis perforans, passes down behind the cannon bone, lying against the suspensory ligament in front, crosses the fetlock joint and is attached to the bottom of the pedal bone. It is the function of this tendon to flex the joint, by raising the bone of the foot and with it the hoof or horny box in which it is contained.

The flexor pedis perforatus is a superficial tendon, following the course of the preceding tendon, but becoming attached to the larger pastern bone; its function is to flex the foot at the fetlock.

The exterior pedis runs down in front of the leg and is attached to the upper face of the coffin bone—its function is to extend the foot and limb.

The coronary band is that portion of the skin which secretes the horn which constitutes the wall of the hoof; this horn much resembles the nail which grows on the toes and fingers of man; it is composed of hollow cylindrical tubes extending from the coronary band to the lower portion of the hoof.

The hoof is a box of horn, consisting of a wall, sole and frog, and contains, besides the coffin, navicular and part of the small pastern bones, the sensitive laminæ, plantar cushion, and the lateral cartilages.

The sole of the foot encloses the box on the ground surface, and is shaped like the circumference of the foot, except that a V shaped opening is left behind, for the reception of the frog, and is concave on the lower surface.

The frog is a triangular shaped body, divided into two equal parts by a deep fissure, extending from base to apex; the horn of the frog is produced in the same manner as that of the sole, but it differs from that of the wall and sole in that it is soft, moist and elastic.

The sensitive laminæ are the thin plates of soft tissue, covering the entire anterior surface of the coffin bone; they are present in great number, and by fitting in corresponding grooves on the inner surface of the horn of the wall, the union of the soft and horny tissues is made complete.

The plantar cushion is a thick pad of tissue placed behind and under the navicular and coffin bones and resting on the sole and frog, for the purpose of receiving the downward pressure of the column of bones, and to destroy shock.

The lateral cartilages are attached on either side to the wings of the coffin bone; their function is to strengthen the attachment and protect the coffin joint.

Shoeing.

The object in shoeing horses' feet with bands of iron should be solely to protect the feet from excessive wear by continued contact with hard roads, and also in these days of fast trotters, pacers, runners, etc., in some cases to balance unevenness of action or correct faulty action such as paddling, rocking, interfering, stubbing, etc.

In the practice of his art no artisan has more need to study carefully the needs of his subjects, than the shoeing smith or farrier. He should possess a knowledge of the anatomy of the foot, the relations of one part to the other, correct conformation and symmetry of outline, and the uses and functions of all, and it should be his aim, and it certainly is his duty, to preserve the natural condition of the foot to the utmost. His task in many ways is not an easy one. He will have to contend with owners and grooms who, in their ignorance, are led to believe that they know exactly how their horse should be shod, and instead of allowing the smith credit for knowing his business will proceed to tell him how he should cut and carve and rasp the foot and fit the shoe.

I have no sympathy with those who find fault with the shoer simply because he is not willing to follow their directions in shoeing their horses. The sooner the smiths give up trying to shoe horses by everybody's plan the better for all concerned. There is only one way to shoe a horse, and that is *the right way*, and it may safely be said that the man who makes shoeing his study is the only person who should be entrusted with the care and management of the horse's feet. The art in this country has not been recognized in its great importance, and consequently has not received a scientific development, but has ever been a mere affair of routine and tradition. Such should not be the case, and it is extremely desirable to urge most strenuously the necessity for farriers being properly instructed in the elements of their calling. In a natural state, the whole or nearly the whole of the under surface of the horses' foot comes in contact with the ground, each part participating more or less in sustaining the weight thrown upon the limb.

On soft or uneven soil, the entire lower border of the wall, the sole, bars and frog are subjected to contact. But on hard or rocky land with a level surface, only the dense tough crust and bars, and thicker portion of the sole and frog come in contact.

The whole circumference of the wall meets the ground and is admirably fitted to resist wear and sustain pressure. It projects more or less beyond the level of the sole, and the space measured between the white zone within it and its outer surface gives its exact thickness. This fact should be borne in mind by the farrier during the operation of attaching the shoe, as the nails are to be driven through this horn, which in most sound hoofs cannot be said to much exceed half an inch; it is, however, thicker at the toe than at the sides. Carefulness and address on the part of the shoer will be necessary in order to guard against wounding the sensitive structures beneath.

The sole is more or less concave from its juncture with the wall; nevertheless, even on moderately firm ground a portion of its circumference, which is generally the thickness of the wall, takes a share in relieving the latter of pressure. This is another fact to be borne in mind. The frog on both hard and soft ground is an essential portion of the weight-bearing face. In the unshod healthy foot it always projects beyond the level of

the sole and seldom below that of the wall at the heels. Its contact with the ground is thus assured, and hence its utility in obviating concussion, supporting the tendons, and on slippery ground in preventing falls.

In pulling up a horse sharply while in a gallop, or in descending a steep hill, the frog, together with the angular recess formed by the bars and wall at the heels of the hoof, are also serviceable in checking the tendency to slip; the animal will be seen instinctively to plant the posterior part of the foot exclusively on the ground.

Dark hoofs are generally considered best as being tougher and harder. A good hoof should have the wall unbroken, its outer face smooth and even, the angle at the front not less than 45 degrees, the lower or ground surface of the front foot should be nearly circular in outline, the sole slightly concave at the circumference, deeper at the centre; the border of the wall should be thick at the toe, gradually thinning towards the heels, but at the inflexion of the bars a strong mass of horn should be found.

The bars should be free from fracture, and the frog moderately developed, firm and solid. The hind foot should possess the same soundness of horn, though it differs from the fore foot in being more oval in outline from the toe to the heels; the sole is also more concave, the frog smaller and the heels not so high; the horn is usually less hard and resisting.

The amount of growth even in a well proportioned foot varies considerably in different animals, according to the activity prevailing in, or the development of the secreting apparatus, and in this respect also the observations of the farrier are of much interest and influence.

It may be laid down as a rule that the horn grows more rapidly in warm, dry climates than in cold wet ones; in healthy, energetic animals than in those soft and weakly; during exercise than in repose; in young than in old animals. In winter it widens, becomes softer and grows but little; in summer it becomes rigid, concave and resisting, is exposed to severer wear and grows more rapidly; thus nature regulates her own necessities, supplies hard horn to hard ground and softer horn to soft ground.

In dry, hot climates we have an animal with small, hard feet, wiry legs and vigorous constitution; while in colder climates where more moisture exists, a longer, less vigorous, less active animal, with larger feet of softer texture, exists

It has been estimated that under ordinary conditions a horse kept in stables such as our own and subjected to about the same daily treatment, the hoof is renewed once a year; that is, in process of natural growth the old hoof will have been entirely replaced by a new one if regularly shod or the horse be used without shoes.

In the preparation of the foot for the shoe great care and good judgment must be exercised. There is practically no use for the draw knife or buttress; the shoe itself should be as light as possible, and should be without caulkins, except where the nature of the work or condition of ground demand it, and then should be made as low as possible.

The lower border of the wall (the crust) bars and frogs, as we have seen, are the parts which in a state of nature come in contact, with the ground, whether it be hard or soft. When a plate or shoe is applied to the foot it must necessarily relieve some of these parts from that contact with the ground which nature intended, and we will find that after a foot has been shod carefully a few months that the frog and bars and sole grow deeper or thicker than they were before shoeing was resorted to; this is simply because the reproduction or growth of these parts has been greater than the wear on account of the shoe interfering to a greater or less extent with the functions of these parts. They do not come into contact with the ground as before. It will be seen, then, that it is of the utmost importance that no tampering should be permitted with any part of the foot except where a portion of the sole and crust are merely flattened down with the rasp in order to make a perfectly flat and smooth surface to receive the shoe.

The shoe itself should, on its upper surface, be perfectly flat and fit with exactness to the rim of the foot. It should correspond to the wall in width, being wider at the toe and slightly narrower at the heels. The under or ground surface should be concaved so as to afford a better grip on the soil and render the horse less liable to slip, and also to render the shoe as light as practicable. No more nails should be used in applying the shoe than necessary—usually from 5 to 7 nails will be found sufficient.

A practice sometimes obtains of applying the shoe to the sole while hot in order to *seat the shoe* as it is termed, or in other words to enable the smith to get the shoe on solid

without taking the trouble to level the wall properly by the rasp for its reception. Two great evils are likely to follow the application of the hot shoe in fitting, viz., the shoe is almost sure to be set on crooked, and the horny tubes of the hoof are injured and rendered brittle and useless by being deprived of their natural condition and moisture. A common practice with most shoers, and one which can be noticed by any one who will take the trouble to go into a blacksmith's shop, is to apply a shoe to the foot which is in reality too small, it is placed at a distance of a quarter or even in some cases when the toe is long, of half an inch from the edge of the crust and after having nailed the shoe to the foot, the portion of hoof around the toe is cut off and rasped down; this practice is productive of the greatest amount of injury.

The nails should not be driven higher than necessary on the wall of the foot, and no rasping whatever should be permitted on the outer surface of the hoof, the clinches should be turned down nicely and firmly; the foot in this way will be maintained as far as possible in its natural state, and if care is taken to have the shoes carefully removed once a month and refitted, we may under ordinary circumstances expect that the excessive wear which would be entailed on the horse's feet by contact with our hard, stony roads, will be avoided and the animal's usefulness in this respect be preserved to those who have use for the noble animal.

I need scarcely remark that the much vaunted hoof oils and ointments are not only unnecessary but in many cases are positively injurious. Nature adapts itself to its requirements. A good hard hoof is what is necessary on our hard roads. If the hoof is softened by artificial means, and then brought in contact with our hard roads it is quite obvious that it cannot withstand the concussion and consequently is damaged to a greater or less extent, as may happen. Besides the sensitive parts within the hoof will have received a certain amount of bruising by concussion and consequent inflammation and soreness of the feet and legs will be the consequence.

If a horse's feet and legs are sore and inflamed after a hard day's driving or riding, the animal should be made to stand in a tub with cold or hot water up to the knees for a couple of hours, then thoroughly dried and given a good comfortable bed and supper.

A good horse is like a good watch. He should have the best of care in handling, feeding, grooming, etc., and the moment any part of his machinery gets out of order, lose no time, take no chances, do not be foolish enough to swap him with the first preacher you meet, but take him carefully wrapped up to the nearest veterinary surgeon, who will be able to detect the injury or ailment, and after giving him a good cleaning out, and perhaps putting in a new main spring, will return him to you as good as new, and warranted to keep good time.

SHOULD DAIRY COWS HAVE DAILY EXERCISE?

By David Nicol, Cataraqui, Ont.

Keeping cows confined during the entire winter season, is commonly practiced on the ground that a larger yield of milk is obtained and less food is consumed as fuel for maintaining bodily heat, than when animals are allowed out door exercise. These reasons may be true in themselves, but in the continuous profit of a herd, there are other considerations which are of more importance than the possible saving of a few pounds of meal. If capacity for producing a vigorous progeny is to be considered, long continued close confinement will be found incompatible with perfect health in the mother, followed by a certain incapacity to produce a healthy offspring. The surest way of deteriorating any race is in weakening and degrading the females, and the more thorough the mode the quicker the deterioration.

I have known instances in which cows were afforded no other winter protection than that of an open shed, and am sure the long exposure to cold weather had a weakening effect on the constitution, as well as a weakening influence on the cow's offspring,

yet I doubt whether the effects of such treatment could be more pernicious, than that practice of keeping a cow's head between stanchions six months during the period of pregnancy.

It seems to me, the only way in which a vigorous progeny can be depended upon, is to breed only from strong and healthy parents; and moderate and judicious exercise is one of the principal requirements for producing perfect health; therefore I think all breeding cows should have daily exercise. They should be allowed at least one hour's freedom daily out doors, provided always, the weather is not exceptionally inclement.

No experienced breeder of horses would keep his brood mare tied in a narrow stall half the year, because he knows that by so doing he would have weakly foals.

When cows are let out only occasionally during winter as very fine days may occur, they are apt to hurt themselves and one another, and the energy they expend causes a reduction in the flow of milk; but when daily exercise is given, injurious results are reduced to a minimum.

No breeder possessed of common sense, would turn his cows out daily, merely to drink from a hole cut in the ice, because it is apt to bring on congestion of the lungs. Practical dairymen provide water of moderate temperature for their cows several times a day. The most successful breeders of choice animals are they who provide box stalls, notwithstanding the extra amount of room required.

There is but little difference of opinion about the economical practice of keeping fatting cattle continuously tied up; it is universal, yet there seems to be much cause for difference of opinion regarding the treatment of breeding cows which are expected to produce improved stock.

I am not alone in my belief that they should have daily exercise.

I know of many able authorities who regard the practice of keeping pregnant females of any kind shut in, as contrary to nature or reason, and the subject is, at least, worthy of our consideration.

THE FUTURE OF WHEAT GROWING.

By John Z. Fraser, Burford, Ont.

The growing of wheat is at present a question which many of the farmers of Ontario are debating. The extremely low prices of the past few years, the partial to almost total failure in some sections, and the different and more varied system of farming at the present time, are all bringing about changes in the sentiment of wheat growing. In certain sections of our province it is folly to depend to any extent on the raising of this grain, even should the price advance to almost double the present market value. For this section my paper is not intended, but for localities where, under ordinary favorable circumstances, wheat can be grown to a certainty and where the farmers are prone to ask, What are the future prospects of wheat?

The chief causes that affect the price of any article is the supply and demand. But in the case of wheat there is no agency that can, to any great extent, increase its consumption, so long as people are fairly well-to-do. The present low price of wheat is due to a combination of circumstances, chief of which is, the loss dealers have incurred in handling it since 1888, by which they have lost nearly all confidence in it. This constant falling in price in time is largely due to the trade policies of various countries, together with the increased value of gold. So long as Great Britain remains a manufacturing country, and other countries look to her as a market for their surplus agricultural products, she can only pay for their products in proportion to the price she receives for her manufactures. To compete with the protected manufactures of the world in their own markets, she has been compelled to reduce the price of her products from time to time, as occasion required, which was done chiefly by reducing the wages of her artizans, which in turn reduced their purchasing powers, or in other words increased the value

of their dollars; for, bear in mind the fact these products must be sold to these people and they could only pay for them in proportion to the extent of their wages. Over production has not, as might be supposed, been the cause of cheapness, for in 1891 with 170,000,000 of bushels more than last year of a surplus, wheat ruled from 85 cents to $1.20 per bushel, and in 1892 with 60,000,000 bushels more than last year; it ruled from 69 to 92 cents, showing the unusual circumstances of *decreased* prices following *decreased* production. But this I attribute to a certain extent to decreased consumption, and which I will treat later in my paper. As to the effect of increased value of gold, the world owes Great Britain three times as much gold as the world contains, and her capitalists annually draw one-sixth of the gold supply of the world in interest, or $500,000,000. The bulk of this, of course, is taken in produce and the cheaper the produce, the chief item of which is wheat, the better it is for them. It is to their interest, which they are not slow in looking after, to keep up the price of gold, for in so doing they decrease the value of produce, of which they consume so largely. So long as they remain masters of finance they hold the key to the situation, and can laugh at the trade policies of other countries, for by cutting off one end they only add to the other and *vice versa*.

As to the prospects of an advance in the future we must consider a few points. Great Britain at one time was the greatest wheat consuming country per head in the world, but to day she stands tenth, showing that she has acquired a taste for other kinds of food besides wheat, or that she is consuming less food. But her trade figures show that her tastes are changing—that she is consuming more meats and such foods than formerly. The process of manufacturing or preparing such articles and the ease and facilities of transportation enable the laying down cheaply of meats, vegetables, etc., fresh and in prime condition and at prices within the reach of all. Canned poultry, meats and fish of all kinds can be bought cheaper there than in Canada or the United States, as trade can be conducted with smaller profits than on this side of the Atlantic.

Decreased consumption is the greatest factor the wheat grower will have to contend with. What a vast difference it would make if Great Britain were like France, consuming eight bushels per head instead of five and three-quarters bushels as she now is. And again I see no reason why her consumption per head should not fall as low in the future as the United States, which is 4.7 or more than a bushel per head lower than at present. The true significance of this will be better understood by the illustration that if the per capita consumption of wheat was as large in the United States as in Great Britain, instead of being exporters they would be importers of this cereal: less than a pound of flour per week extra consumed per head would bring this about. United States authorities are now predicting that before many years they will be importing wheat and flour from Canada, and these figures seem to point in that direction; but when that time comes it will be early enough to consider it then. In the meantime turn your attention more largely towards supplying the tastes of the British consumer, which is in the direction of pork, beef, cheese, etc., and when the time comes when wheat is in greater demand at enhanced prices—which it will be before a decade passes by—your land will be in condition to produce it at a very handsome profit. Wheat must always remain the first of earth's products. It has been the steady and constant friend of the Ontario farmer for a half century, and I do not see any occasion why it is likely to desert him when the present unavoidable and natural course of events pass away.

Unlike Prof. Shaw, I have great faith, if proper judgment is used, in the agricultural resources of this country. In writing a couple of years ago on the future of our live stock industry, Prof. Shaw pointed out that the export of agricultural products was falling behind animals and their produce at an alarming extent, and, to quote his own words, he said, "the grain selling era is forever gone and the best interest of the farmer lies in the production of live stock and its products." He pointed out that the export of animals and their products amounted in that year to $23,894,707, whilst grain products only amounted to $13,114,111, and also quoted the public documents to show that the export of wheat declined 90 per cent. in ten years, or from 6,610,724 bushels in 1879 to 490,905 bushels in 1889. But the reverse of Prof. Shaw's prophecy seems to have taken

place, for I find that grain products have gone up from $13,414,111 in 1889 to $22,113,284 in 1892, or an increase of 65 per cent., whilst animals and their produce have increased from $23,894,707 to $28,594,850, or an increase of only 20 per cent. The export of wheat alone has gone up in that period from 490,905 bushels to 10,038,138 bushels, or an increase of over 1,900 per cent., or 3,427,414 bushels more than in 1879.

These figures serve to show what a wonderful grain-producing country we have, more especially in wheat, and it also shows that our farmers are improving their methods in agriculture. But to my mind they must increase the output of animal products and decrease that of wheat, and when they do that they will find greater financial benefits accrue.

HOW TO MAKE TEN COWS PAY.

By Prof. H. H. Dean, Ontario Agricultural College, Guelph, Ont.

Ten cows is, perhaps, the average number which a farmer should have before he will begin to realize that he dairying in earnest. Where but from three to five cows are milked, they are usually looked upon as a side track—"the women kin have 'em to make a little pin money." Too many persons who own cows are playing at the dairy business, just like children who keep house, go visiting and dress dolls. But in order to make money out of cows nowadays, we need to study and hustle.

The first requisite is that these ten cows shall be owned and cared for by a dairyman or a dairywoman. You say, "Oh, pshaw! that is easy enough." Well, now, let us see whether it is or not. The following are some of the points of a good dairyman:

He (or she) should be neat, clean, a good farmer, a good judge of cattle, a good feeder, kind, thoughtful, and should have business ability to buy and sell to advantage. All dairymen who have all these qualifications, hold up your hands!

The next requisite is that these cows should be the very best cows that can be had. Every one of them should be a standard cow—cows that will give 6,000 pounds of milk or make 250 pounds of butter in a year, and as much more than this as possible. To get these cows, the surest way is to breed them. Buy them if you can; they are cheap at from $40 to $50 per head. The third point is that these cows shall be properly housed and cared for, and be fed on cheap food. The money lies between the cost of production and the price obtained. The former should be as low as possible and the latter—well, all you can get. Grass and soiling crops are good for summer feed, with some bran or meal when pastures fail; and for winter, use silage, mangels, carrots, sugar beets, clover hay, peas, oats, bran, ground wheat, linseed and cottonseed meal. Give variety and all that the cows will eat up clean.

After the milk has been produced in the best and cheapest manner it must then be marketed in the best way. There is great loss where this is not properly looked after. If considerable time, labor and money have been spent up to this point, it is very important that the latter part of the business should be well handled.

After the needs of the family have been properly looked after—and I do not believe in selling the best and eating the poorest at home—the rest is usually disposed of in one of the four following methods:

1. *Home Dairy.* To make a success of this it is necessary to have plenty of help, good utensils, proper milk rooms, a knowledge of how to make butter or cheese, or both, and a suitable market for the product. If a person is not near a factory or has a good market near by, together with previously mentioned requisites, it may be advisable to engage in the home manufacture of butter or cheese. Otherwise for the mass of farmers the factory plan is better.

2. *City or Town Milk Trade.* A good city milk trade is very profitable. By making specialties such as bottling milk, Pasteurizing the milk, keeping special cows for children and invalids, supplying skim milk at reduced rates and buttermilk made from cream or skim milk—this trade is very remunerative. A great deal of labor is connected with the work, and where the milk is shipped to middlemen there is often a great deal of risk in not getting money for milk shipped.

3. *Creamery.* Creameries in Ontario are of two classes—cream gathered and separator. In the former cream only is taken from the farm and the skim milk left for feeding. This class of creamery is an advantage where roads are poor and cows scattered. To insure its success all the patrons should provide deep cans and cold water. A supply of ice is needed to cool the milk to below 45°. Cream raised in this manner will not give so high a test, but there will be more inches of cream from the same number of pounds of milk and it will produce a finer article of butter. High testing cream and ordinary shallow pan cream are a hindrance to the buttermaker in a cream gathered creamery. It is necessary in this kind of a creamery, as in all co-operative dairies that all the patrons should co-operate to make theirs one of the very best. One patron cannot make the reputation of a factory though one may mar it.

If the separator creamery is patronized, milk should be sent of good quality—well aerated and cooled—and the skim milk should be fed to calves and pigs, in order to reap the greatest profits. As a rule there is more money made from milk sent to a separator than to a cream-gathering creamery, as the cream is more completely taken out of the milk by the separator than by ordinary methods of setting. Beef and butter make a very good combination, hence in beef-raising sections the creamery is more popular than the cheese factory.

4. *Cheese Factory.* In sections where factories pay by the hundred, to make money out of cows (and out of your neighbors) get those cows that give a large quantity and send every drop of it to the factory—Saturday nights and Sunday mornings included. You will doubtless have some neighbors that sell cheap butter. Buy from them and send your milk away. That's the way to make money out of cheese. A well managed joint stock company usually pays higher dividends to patrons than to private factory.

If the factory divides proceeds by test it will pay to keep a few cows that give very rich milk to bring up the average of the whole. Cheese factories have paid well in this province. Support the factory if there is one in the locality.

It is somewhat difficult to raise calves in cheese factory sections, but by having the best cows drop their calves some time before the factory opens, fairly good calves may be reared.

The dairy cow and the hog make a combination that it is difficult to surpass. Not only do they pay well, but they are a "combine" that does not take anything unjustly from anyone else. Give us more cow-hog combines and we'll not hear of so many farmer farm separations.

THE IMPORTANCE OF GOOD HOME TRAINING.

By John I. Hobson, Mosborough, Ont.

One of the reasons for taking this subject, is, that it has often been said that one of the difficulties in keeping up an interest in these Farmers' Institute meetings is the narrow range within which subjects can be selected suitable for gatherings of this sort. Now, while it is not correct to say that the field is a narrow one, it is true that a mistake is very often made in going over and over the same ground too often. The winter and summer care of cattle, how to keep the farm clean, profitable dairying, etc., are subjects, the knowledge of which is closely bound up with successful farming, but having been discussed and rediscussed at meeting after meeting in the same localities has tended to give an air of monotony to these gatherings. There is no question that to keep up an interest in this work we must cover a wider field. We must not be carried away with the thought that the *whole* object of attending a Farmers' Institute meeting is to catch some idea whereby we may go away and feel that we have learned something that will make us richer from a dollar and cent standpoint. It is very true that the primary object, and also the effect of these meetings is to lead us into more profitable practices. But it is also equally true that as factors working in the direction of bringing about a better state of things they will in a large measure be failures if the ideal which we keep before us be no higher than how to make more money at farming. As well as dealing

with the purely practical, the aim should be to make the farmer more hopeful—to inspire him with more courage to face difficulties, to develop a feeling of enthusiasm and a desire to lift his occupation to a higher level.

I have been led to think more deeply on this matter from what has come under my observation during the twelve years that I was engaged in judging the prize farms of Ontario. Opportunity was then given me of studying out farm life in all its phases, and I soon found myself considering it not only from the standpoint of money making, but from the moral, social and intellectual. I have seen the prosperous and progressive farmer making himself rich by successful farming and at the same time making life enjoyable for those dependent upon him; and as one viewed the pleasant surroundings and listened to the intelligent talkers in the comfortable farm home, we were led to think that here was clearly demonstrated that there is nothing incompatible with successful agriculture and refined minds and cultured tastes. These farm homes are confined to no locality, they are to be seen in the counties in the extreme west—they are thickly studded on those rich farm lands bordering on the shores of Lake Ontario, and in not a few of them have we been hospitably entertained near the dividing line from that rugged part of our province where the tired dwellers in the cities love to go and spend their often well earned holidays. All over the country right down to the province line of Quebec are these model homes to be found and those dwelling in them are doing more in the direction of working out the destiny of the land than they themselves are aware of.

Then on the other hand, there are a vast number of farm homes in this land where there is not one redeeming feature—where every object lesson within and without tends to mould the minds of the boys and girls growing up under the influence of their dreary surroundings in the wrong direction, for depend upon it the children growing up around us form their impressions from their surroundings. It is all very well to talk about the laws of heredity, but we must not overlook this fact that the *fertility of soil* has much to do in the development along those lines whether it be for good or ill.

This leads me up to the question of home training, and perhaps the followers of no other occupation are more affected by it than the sons and daughters of our farmers. From one cause or another, but very few of those who are going to follow farming as their life's calling ever have any other means of acquiring education than what is obtained at the public school, and what may be termed self education, which is largely acquired at home. Most parents now give their children a fairly good common school education, but it is the rare exception to find in the farm homes of this country anything worthy the name of literature. In every other trade and profession it is deemed essential that those following it should have some special training. But in the case of the average farmer, what special training does he get? As already said usually a fairly good course at the common school. However, even in this part of his education there is hardly a single study which bears directly on the work of after life. It may be said that we have an agricultural college where a thorough and systematic training in scientific and practical agriculture can be obtained, but it is a fact that only one out of a great many of farmers' sons for one reason or another do or can take advantage of it. It then follows that those whose lives are going to be spent on the farm, having had but limited opportunities of acquiring knowledge along those lines which will be useful to them in after life, that every facility should be given to them to obtain it by the farm fireside. Now, what are the facts of the case? As already said there is simply nothing worthy of the name of literature. It is too often the exception to find even an agricultural journal; perhaps a local paper coming once a week and a few old books—heirlooms in the family.

It is true that there is no condition in life more favorable for developing sturdy energy and manly self-reliance than the environments of the well regulated country home. It is in the best class of farm homes where those habits are formed and where that strong character is built up that bears the country-bred boys to the front when they come in contact with other young men in the battle of life. But to bring about that condition of things every facility must be given to carry it out. The life on the farm must not be made so burdensome by long and weary hours and ceaseless work that no time for recreation is given, or the energy become so exhausted as to leave the boys and girls with little spirit left for reading and study. Then, again, mental food must be provided. No

man in our day can ever hope to make a permanent impression on other men unless he have almost daily intercourse with master minds of some sort. In what other way can the ordinary mortal get it?

In providing this literature too much care cannot be exercised in its selection. The average boy or girl is not going to work all day and then sit down and study or do a lot of dry reading at night. Not only should the reading be provided for the younger people of the household, but the older ones as well. There was a time when the stern Presbyterian of fifty years ago thought it was sinful to have a work of fiction in his house. Now the intelligent reader knows that the writings of Sir Walter Scott and Charles Dickens have done more to brighten the lives of weary workers and to bring sunshine into may a dull home than perhaps the works of any other authors living or dead. What other writer or what history has given us a better knowledge of the customs and habits of the people of the times of which he wrote than has done Sir Walter Scott? What history of the middle ages will give to the reader a more truthful picture of those times than is to be obtained in Ivanhoe, or of the time of Queen Elizabeth than by reading Kenilworth? However, it is not my purpose to give a list of books which it is desirable should be found in the houses of our farmers—men must be guided in a measure by their own tastes. But this I would emphasize, that it is of the very first importance that a fair supply of good literature should be provided, and that it is only in this way that we can ever hope to see the farmers of this country take that high place relatively with the followers of other callings that it is so desirable they should do when we consider how great are the interests they represent. When we look at it merely from a business standpoint it is now admitted by all thinking men that science is indispensable to due success in agriculture. A knowledge of this must be largely acquired by study. Life is too short to work it out by one's own experience. The man who refuses in working out problems in his own profession to avail himself of the recorded experience of those who have gone deeply into the questions he proposes to solve is to say the least prodigal of his time. The farmer who is desirous to be successful cannot afford to pass carelessly by the guide posts erected here and there along the way by those who have travelled the same way. We should never forget that all education to be worth anything must be largely self-education.

"The true University of these days," says Carlyle, "is a collection of books."

THE CARE OF MILK INTENDED FOR CHEESE FACTORIES.

By Robert Harcourt, B.S.A., Assistant Chemist, O. A. College, Guelph, Ont.

Many of the greatest difficulties that cheese makers have to contend with are caused by the carelessness of a few of their patrons, who, regardless of taints, seem to consider that if they keep the milk sweet they have done all that is required of them.

Too much stress cannot be laid upon the fact that to make good cheese the milk must be absolutely pure. Impurities in the milk not only affect the product as an article of diet, but the very process of manufacture is made more difficult and unsatisfactory; indeed, in some cases milk is sent to the factory from which it would be impossible to make a marketable product. It must be borne in mind, that while milk is extremely sensitive to odors and taints of all kinds, its animal source makes it especially subject to contamination. The health of the cow, what she eats and drinks, the kind of treatment she receives, will affect the milk before it is drawn from the udder. Even the surroundings, while it is being drawn, are more or less unfavorable to purity and cleanliness. Thus it will be seen that good clean milk can only be got as a result of the most absolute cleanliness from first to last.

The causes of impure milk are many; the whole stage of its existence is critical. Any foul air taken by the breathing into the lungs of the cow will become mixed with the blood and is taken up by the milk as it is secreted. A writer in the *Chicago Live Stock Journal* gave an instance where twelve cows were subject to the scent of a dead

calf that was lying twelve rods from the lane through which the cows passed. The exposure of the animals to the tainted air was but for one minute daily, yet the effect was to nearly destroy for cheese-making the milk of eighty-five cows with which the tainted article had been mixed. The burial of the calf removed both the cause and the effect.

Food and water constitute the raw material from which milk is produced, consequently we need not expect to get a first-class article from third rate material; for although we may persuade the cows to eat musty hay and mouldy cornstalks, these will show themselves in the milk. During the summer strong tasting weeds should be particularly guarded against. Very often, especially in dry times, the cattle are allowed to drink filthy, stagnant water. Cases are far too common where milk has been rendered wholly or partially worthless by the cows having access to impure water. Milk is 87 per cent. water and this, if foul when drunk, will not be pure when yielded up to the milker. Ill health, whether it be a chronic disease or a momentary derangement of the internal organs, worry from dogs, or abuse from man, will quickly affect the milk.

Then too, milk is a great absorbent. The readiness with which it will absorb impurities and the effect upon it of such absorption is not fully appreciated. Milk kept over night in a smoke-house or hog pen, or even near the barnyard, will very likely be returned from the factory in the morning, no doubt, much to the surprise of the owner, who fancies that all he has to do is to keep it sweet. The time when milk is most absorbent is when it is cooler than the surrounding medium, therefore, it should be kept only where the atmosphere is absolutely pure. But no matter how particular the dairyman may be in preventing any of the foregoing causes, if he uses ill cleansed vessels his milk cannot be good. Milk contains minute living germs, which are an active cause of decomposition. Any of these allowed to remain in the cracks and seams of the vessels will rapidly develop in the next milk poured into them, and it is wonderful how rapidly a cause apparently so slight will hasten the decomposition of milk.

Having spoken of a few of the causes of impure milk, let us consider a good way for the cheese-factory patron to look after his milk. We will take it for granted that he has seen to it that his cows are not subjected to foul odors from whatever cause, that there are no strong-tasting weed in the pasture field, and that there is an abundance of pure water. The milking place and time should be so arranged that the cows are free from all annoyance and excitement. If it is in the stable the place should be well ventilated, and plenty of straw, or other absorbent should be spread under the cows. Water, dirt or hairs dropping from the body and dirt spattering from the floor should be particularly guarded against. Above all, see that the udder and teats are clean. Where the animals are well cared for and properly milked at previous times it is comparatively little work to prepare them for milking. If the udder has to be washed see that it is well dried before commencing to milk, and do not wet the hands, for the worst of all dirt to get into the pail is that which trickles down in the liquid form. It cannot be strained out. It is more pleasant as well as more cleanly to milk clean dry teats with clean dry hands. After the milk is drawn carry at once to a convenient place where the atmosphere is pure and there strain. A cloth strainer, when it is of good material and properly cared for, is to be preferred to a wire one; but where cloth has been used taints have been traced directly to it simply because it had not been properly cleansed; for this reason factory men are more inclined to recommend the wire strainer. Froth and dirt should not be allowed to accumulate upon the strainer, nor should it be stripped through the fingers to force out the last of the milk.

Now having the milk properly strained many dairymen would commence to cool as fast as possible, and right here is where much otherwise good milk is at least partly spoiled. The milk should be well aired by dipping or pouring immediately after straining before any attempt is made at cooling. Long experience has satisfied many of our best cheese-makers that if the milk is properly aired no cooling is required excepting, perhaps, in the hottest weather. A very simple and easy method of airing milk is to keep it in pails for some time, stirring it quite often so as to keep it exposed to the air, and the last thing at night give it a good dipping. This milk should never be mixed with that of the morning until the milk-waggon reaches the stand. Handled in this way it will always reach the factory in good condition and will work along

without trouble in the maker's hands. Much of what is known as "gassy" milk, which makes hours of extra work for the factory men, is caused partly, if not altogether, by lack of aeration. An experienced cheese-maker can easily detect milk that has not been aired.

Pails, dishes, cans, strainers, etc., used in connection with the milk should be rinsed out in cold or lukewarm water, then scalded out with boiling water. In the washing of all dairy utensils a good stiff brush should take the place of the old dish rag. The brush is much more easily kept clean and will do its work quicker and more effectually. If the cloth is used it should be well washed and scalded and thoroughly aired each time it is in use. Cleanliness and aeration are the two key notes to success in handling milk, and only as the dairyman attends to these need he look for success.

SWINE FOR PROFIT.

By Capt. Geo. Farewell, Oshawa, Ont.

History records the fact that there were no hogs in America until Columbus brought them in 1493. They were introduced into Virginia in the year 1609.

The power that these Virginia forest hogs possessed in bringing forth in great abundance, was such that after eighteen years of interbreeding they had multiplied to such an extent as to be considered a great nuisance by the citizens of Jamestown, who fenced the town about to keep them back in the woods. It is said, that now in some of the Alabama swamps there are numberless wild hogs, so lean and tough, that no quantity of feed will fatten them.

Kindness and care are entirely thrown away when used for the purpose of domesticating them. Having lived wild so long, they have come to be in nature like wolves. Indeed they have been known to chase persons much in the same manner, driving them to trees, and places of shelter.

That they are very prolific was proven by a gentleman of that state who secured a male and female and kept them a year, feeding them liberally with corn. At the end of the year they were no fatter, but they had produced 200 young pigs during the year.

Though they were of the hazel splitter and land pike pattern, it was shown by their immense numbers the wonderful power of exercise for breeding purposes. We can learn a valuable lesson from those wild pigs; to give the breeders as great a range as we can with as little feed as is consistent with good health; securing to them the quality of being prolific, one of the most valuable characteristics of a breeder.

In winter turn the breeding sow out. Give her the run of the whole barn-yard. Provide a place dry and warm for her to sleep in the cow house, horse stable, or other warm buildings; feed her a few ears of corn daily in cold weather.

I feed pulped turnips, corn or meal. Let her have access to good clover hay, they are very fond of it. I have known pigs wintered on clover hay and turnips. A little rough meat thrown to her will be eagerly partaken of. A trough containing wood ashes and salt put where she can help herself, will serve a good purpose. On this exercise and feed she will be strong, in fair condition, and in just the best possible trim to bring forth a brood of young.

The period of gestation is usually sixteen weeks. Young animals carry their young a shorter time than animals that are grown. A sow will be good for breeding five or six years with proper feed and care, but she must not be allowed to get too fat. As farrowing time begins to arrive, which for profit should be March or early April, move her into a warm pen with a board floor with little bedding. Cleat stiff poles all around the inside of the pen seven or eight inches above the floor and the same distance from the sides to prevent the sow from crushing her pigs.

Cultivate the acquaintance of your sow by kindness. Rub her down often with an old broom. It will pay you many per cent to have her fond of your attentions.

Be on the sharp look out for little pigs at the right time and take care of them. If cold, warm them, as the first few days of their lives are the most important.

Give them a good start in life and push them on by judicious feeding. In summer give them a large run on grass, with grain to keep them in good condition.

The kind of a sow for a breeder is the best one that can be procured that possesses great length, short legs, deep sides, broad straight backs and full hams. She must be active and have good teats, six at least on each side.

There is much in the breed, but no money can be made out of any improved breed except by the best feeding every day from the time the pigs are born until they are ready for pork. The first 100 lb. of pig costs but little to produce.

It has been found by experiments that about 1½ lb. of grain are required for the maintenance of the animal body ; that is, a pig fed 1½ lb. of meal or grain per day holds its own, making no gain ; if the food is increased to 4½ lb. a day the pig will thrive and grow a pound in weight per day. The extra three pounds return one pound in weight.

When the 100 lb. pig has increased to 200 lb., the food of support must be increased to nearly double. When the pig has reached 500 lb. the food of support is five lb. or one lb. of food each 100 lb. of animal carcass. The decrease in the amount of food of support is gradual. Starting at 1½ lb. per hundred lb. of pig and diminishing till it reaches one lb. per hundred with hogs weighing 500 lb. But the five pounds of meal required to support the 500 lb. hog is a half pound more than that which the same hog required when it weighed 100 lb. for maintenance and increase. The five hundred pound hog requires eight lb. of meal to give a return of one pound of gain in weight.

While 4½ lb. of the same feed was sufficient for the same pig when it weighed only 100 lb. This fact should induce the farmer to sell pigs as soon as they reach the weight of 150 lb. to 220 lb. and from six to eight months will make the required weight.

Recent experiments at Ithica Experiment Station, N. Y., have shown that the manure made in one year by 1,000 lb. of live hogs is worth $60.00, calculating nitrogen at 15 cents, phosphoric acid at 6 cents, and potash at 4½ cents per lb. The feed they used, with the exception of meat scraps, was similar to that used by many farmers in breeding swine. This fact makes hogs the most valuable animals on the farm for the production of manure. The trial extended to other animals as well, but the value of the pig manure was double that of sheep, calf, cow or horse manure.

There is no better food for pigs than milk after they are a few weeks old. Sour whey has been shown to be a poor feed for hogs, but sweet whey is good when used with shorts. If short of milk for young pigs shorts used with water is valuable food.

Pork generally brings the highest price in this province between the first of April and the last of September.

EXPERIENCE AS A FARMER AND DAIRYMAN.

By Sills Shaver, Winchester Springs, Ont.

As a farmer among you I have tried dairying on a small scale and raising grain for market ; not being satisfied altogether with my results therewith, on account of low grain prices, I then went into horse raising to quite an extent, and was quite successful until prices in that line began to fail. Then having a farm adapted for raising hay, I sold all my horses except those necessary for carrying on farm work, and all my cows except one, and four Jersey heifers and a pure bred Jersey bull calf. I then thought I would raise hay for market. The second year I could not sell at any price. Then, seeing I was going to run down my farm, I thought I would raise some Jerseys. But not knowing anything about winter dairying, and only milking my cows about seven months each year, and not knowing how to feed my stock as I should, I could not see where there was any real profit in keeping cows. If there is such a thing as the blues, I had them then. Just here a man came along to buy four of my high grade Jersey heifers which I was glad to sell. After he bought them he persuaded me that winter dairying was just the thing, and also highly recommended the silo. He also gave me a couple of copies of *Hoard's Dairyman*, and after examining them carefully, I saw that in this paper was

the information I so much needed. I at once signed for the paper, and have been a reader of that paper ever since. I owe my success in dairying largely to *Hoard's Dairyman*, which any farmer ought to have. I concluded after he was gone that I would plant corn (it being in April then), and also build a silo. I at once had my six Jersey cows served by my Jersey bull, calculating to try winter dairying. I also bought in the fall four fresh milk cows and entered upon winter dairying, which has proved to me very profitable. I then began to test my cows by weighing each cow's milk, setting the same separately, and weighing cream also, churning each cow's cream separately and weighing butter. It proved a wonderful revelation to me. Some disappointed me one way and some the other. In the fall of 1892 I purchased more cows, also a Laval cream separator and a Babcock milk tester, and shortly after that time I got a market for my butter at 23c. per lb. by the year. I began at once to study the cow. What to feed, and how to care, I found that it was through kind treatment, proper feed and bedding, and most necessarily a warm stable. I have been able to bring up those cows, all of which are young, and some only nineteen months old when milking, to average $53 per head for butter, which was marketed only, not counting my skimmed milk, or milk and butter for family use. I am delighted with dairying both winter and summer, and know that it pays. I also can increase my average per cow considerable. I am now getting 25c. per lb. for my butter. I always milk my cows eleven months each year. My herd now consists of twenty-one cows and thirteen heifers. I raise all my heifer calves. I am also delighted with my cream separator, and I do not see how any man can afford to do without a separator who has ten or fifteen cows. I also fail to see how any man can make a success of farming without keeping a good stock of good cows, and then feeding them well. If it pays to keep them at all (and it does), it pays to keep them well; I find it so.

CULTIVATION OF GRAPES IN A COLD VINERY.

By Lieut.-Col. White, Ottawa, Ont.

I have often wondered that so few persons cultivate grapes in a cold vinery—that is in a vinery in which not artificial heat is used. My own experience leads me to the conclusion that any person can, at a comparatively trifling expense, produce a large quantity of the finest grapes. The first and indeed almost the only expense is the cost of the vinery. The one I have is 36 feet long, 12 feet wide, 2 feet 6 inches high in front, and 14 feet high at the back. It is what is called a "lean to," that is, it is built against the south-west side of my house, the stone wall of the house forming the back of the vinery; the rafters are 4 feet apart, that is to say, the sashes are 4 feet wide.

In preparing the land I took the ordinary soil of the garden (almost pure sand), and enriched it by a liberal addition of well rotted stable manure. The vines were two years old when planted. The kinds selected were Black Hamburg, West St. Peters', Grizzly Frontignan, Golden Hamburg, Rose Chasselas, and a white grape called Gros Colmar. Of these I found the Black Hamburg, the Golden Hamburg, the Rose Chasselas and the Grizzly Frontignan by far the best. West St. Peters' and the Gros Colmar being very uncertain bearers. The first year after planting I allowed the vines to grow pretty much as they pleased, but the close of the season cut them back about 18 inches or 2 feet, leaving a single rod. The second year I allowed the leading root of each vine to grow half way up the rafter, and then stopped it, allowing it however to start again and continue to the top of the rafter. The laterals or side shoots were also pinched off from time to time so that they never exceeded four or five joints by the end of the season. When the wood ripened and the leaves fell off the leading shoot of each vine was again cut back, this time however to about 8 feet, the side shoots being cut back to the bud at the base of each. The third year each vine may be allowed to bear a few bunches, care being taken not to allow over bearing, six or eight bunches to each vine being quite as many as should be allowed. These bunches are borne on the side shoots, which should

be pinched or stopped two leaves or joints beyond the bunch. No fruit should be allowed on the leading shoot, which should be permitted to continue to grow to the end of the rafter.

Grapes should be thinned so soon as possible after they are set. Thinning is one of those things which can only be learned by practice, the object being to allow every berry to swell perfectly without being jammed or crowded. After the grapes are all gathered and the vines have been pruned, I take them down from the rafters, lay them upon the ground and cover them over to a depth of 5 or 6 inches with soil, and upon that I put a few inches of dry leaves or some old matting, it seems to be quite as desirable to keep out the heat in early spring as it is to protect them from cold in the winter. I do not uncover my vines in spring until the beginning of May. The snow from the roof of my house slides down upon the vinery, and I have therefore to keep the sashes covered with wooden shutters until all risk from heavy snow is over. The borders outside the vinery should be covered, before the hard frost sets in, with sufficient manure or dry leaves to keep the roots of the vines from freezing, and I think it is better not to grow anything on the outside borders as the roots of the vines require plenty of food and will sometimes penetrate a long way in search of it.

I have followed the system of having one or at most two rods to each vine, cutting back the side shoots to the main stem every year. This close cutting system may result in somewhat unsightly vines, but experience has shown that vines so treated will continue to bear for very many years. A writer on vine-culture quotes an instance at Wrotham Park where a vine so treated had a stem 1 foot 7 inches in girth, and had borne a good crop every year for 80 years. Another instance is given of a Muscat vine at Harewood, near Leeds in England, planted in 1783—this vine has two leaders, each about 17 inches in girth. The celebrated vine at Hampton Court, planted in 1768, is grown on the extension principle, that is the one vine fills the whole vinery covering an area of 1,950 feet, and yields from 600 to 800 lbs. of grapes every year.

BEAUTIFYING THE FARM.

By Wm. Rennie, Farm Superintendent, O. A. C., Guelph, Ont.

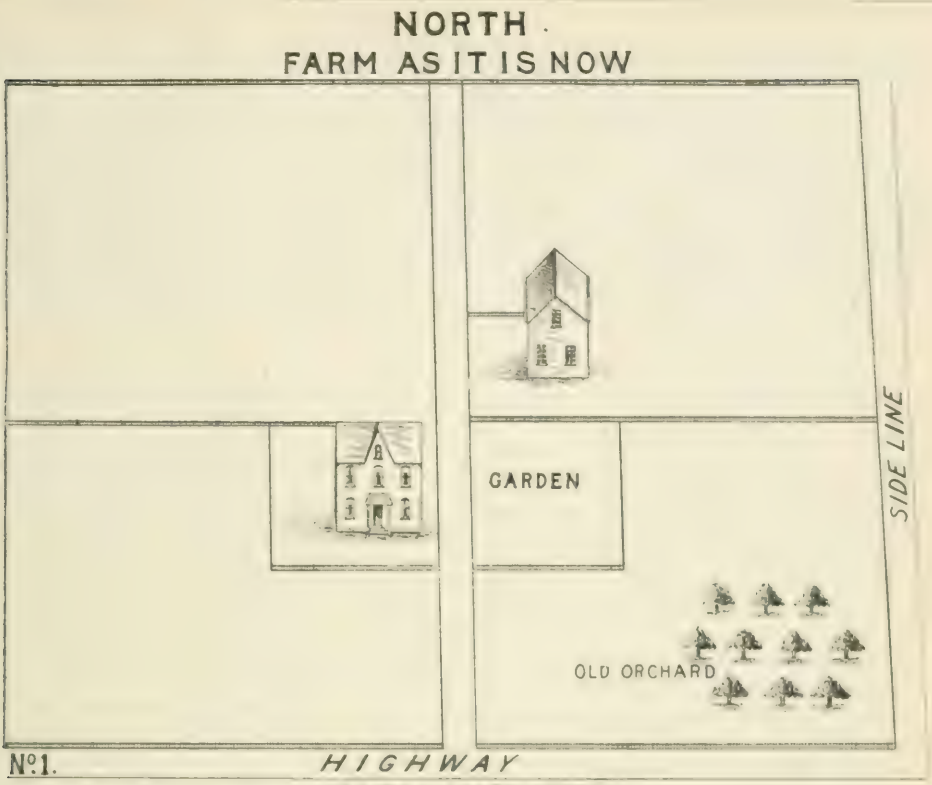
No class of people have such opportunities to make their homes pleasant and attractive as the farmer. Having sufficient land he can arrange for the most ornamental surroundings at little cost. The artist, in selecting a subject to paint a homelike picture, does not choose a fine city residence, but a country home with its surrounding scenery.

The beautifying of our homes is a matter that should receive our first attention. Many of our Ontario farmers have expensive houses and barns, yet their places are not homelike or attractive. It is to be regretted that so many of our farmers do not take advantage of their opportunities and give more attention to the beautifying of their homes which, even from a financial standpoint, is a paying investment, as it enhances the value of a farm very much to have the grounds in front and around the buildings tastefully designed and planted with trees skilfully arranged. It also makes the farm more interesting for the young people, thus tending to keep them on the farm by offsetting the allurements of city life by the more real beauties of an attractive country home.

The first thing to be done is to prepare a sketch and work to it the same as working to an architect's plan when building a house. In this way the work may be accomplished with more system and satisfaction and at the least possible cost.

No. 1 diagram represents a farm in the County of Wellington "as it is" with a substantial brick house and a large barn with stone basement. This may be said to fully represent the better class of farm buildings in the older portion of Ontario.

No. 2 diagram represents the same farm "improved." The additional cost is only trifling compared with the additional comforts derived from the large lawn and evergreen trees as a protection in winter.


NORTH
FARM AS IT IS NOW
GARDEN
SIDE LINE
OLD ORCHARD
No 1.
HIGHWAY
FARM IMPROVED.
ORCHARD
SIDE LINE
No 2.
HIGHWAY

As a rule there are too many fences in close proximity to the dwelling-house and too few evergreen trees. Hence it is necessary first of all that the fences and other obstacles be removed from around the dwelling-house, and that several acres be enclosed with a wire fence. The whole enclosure should be graded, manured and thoroughly cultivated. Two or three acres should be reserved for ornamental grounds and the balance for orchard, small fruits and vegetables. We would recommend that the ornamental grounds be kept seeded with fine permanent grasses, viz., White clover, Red Top and Blue grass (equal quantities), using about 15 lb. of the mixture per acre. It is advisable to sow a little grain with the grasses to protect them from the hot sun. The grain should be kept cut and not allowed to mature. Inside the wire fence, say 15 inches from the wires, plant evergreen trees (Norway spruce is very suitable) 15 to 20 inches in height and 30 to 40 inches apart for a hedge, and 40 to 50 inches apart for a wind-break on the north and west sides.

The proper time to plant evergreen trees is from the 15th to the end of May. Great care should be taker to protect the roots from the sun and wind from the time they are taken out of the ground till planted. If the pitch in the roots becomes dry they are sure to die. The soil should be cultivated and made in the best possible condition before planting, and a mulching of coarse manure or sawdust is desirable after planting. For a hedge the trees require pruning but once in two years (in the month of September); cut off the tops even with the top of the wire fence, and trim the sides close to the wires close on the outside. The opposite side should be trimmed parallel.

In laying out the grounds avoid straight paths and drives as much as posssible. A straight path from the front door of the house to the road is very objectionable. It is much better to have the entrance from the highway at the side, and the walk leading to the house should have easy and graceful curves. The grounds in front of the house will be greatly improved by planting trees and shrubs arranged mostly in irregular groups, and not in close proximity to the dwelling-house. It is well to mix evergreens with deciduous trees in grouping. The grass may be cut as often as necessary at little expense with an ordinary two-horse mower or scythe. When the trees are artistically grouped it gives the grounds the appearance of a beautiful park. It pays to plant both fruit and other trees on the farm. They are useful and ornamental, and as we said before, increase the value of the farm very materially.

In planting an apple orchard it is a great mistake to plant many varieties, one or two kinds that are adapted to the locality and suitable for export being sufficient. For convenience in cultivating it is desirable to plant apple, pear, plum and other trees in rows, which should run north and south where possible. The smaller fruits and vegetables may be grown in the same rows between the trees, thus making it possible to do most of the cultivating with the horse.

In planting ornamental grounds it is not objectionable to have several kinds of fruit trees grouped with the evergreens and other trees. A group of dwarf fruit trees in a lawn in addition to flowering shrubs is quite ornamental.

After the grounds are once laid out and properly planted, very little additional expense is necessary. Nature will now do the rest. A few flower beds may be cut in the lawn; the designs should vary, always avoiding sharp angles as much as possible. A rockery in some shady corner is desirable, and when planted with perennial flowers and several varieties of our native ferns requires very little attention.

The farm buildings also require attention. They should be painted, and this can be done at small cost with the common mineral paints It is desirable to avoid all loud colors, a drab color with the trimmings a shade darker has a quiet and pleasing appearance which cannot very well be improved. A brown color with trimmings a darker shade is also in excellent taste. But whatever color is chosen let it be adopted for all the buildings, fences, etc., on the farm; the pleasing effect of this needs to be seen to be fully appreciated.

A word or two about beautifying the farm proper. First, clear away all the fences that can possibly be done without. Half the fences throughout the country are a nuisance; they are harbors for thistles and all kinds of weeds, and they are also objectionable from an artistic standpoint. They continually need repairing, and have to be renewed

every few years; this is a serious drain on the profits of the farm. Every farmer should have a convenient, portable fence that could be moved in a few hours to any part of the farm, and when not in use should be piled in some out-of-the-way place.

The planting of groups of trees throughout the farm on the high spots adds very much to the general appearance, and in a few years will also be useful in affording shade for stock.

The farmers who will beautify their homes by laying out the grounds and planting fruit and ornamental trees will not only be amply rewarded in the increased value of their properties, but will add very much to the comforts and pleasures of their own lives, and will leave to their children a living monument that will be their pride and delight.

THE CANADIAN THISTLE AND A MEANS OF ERADICATING IT.

By Simpson Rennie, Milliken, Ont.

The Canadian thistle is not the most difficult weed to eradicate, yet it is considered to be doing more injury to the crops throughout this province than any other weed.

It is to be found on nearly every farm as well as in all out of the way places. It spreads not only by its roots but by its seeds, which are attached to a light downy substance and when ripe this becomes detached from the stalk and the seed is borne away for miles by the wind. Hence it is very difficult to keep a farm free from these weeds even after it is once cleaned, for the reason that a field may be put through a cleaning process and be perfectly clean, yet in the fall of the year the winds will spread the seed over this field as well as any other, and the more fertile the land is the more likely the seeds are to grow. As soon as a thistle seed germinates it sends down a tap root for about five or six inches below the surface of the ground; then it sends out lateral or horizontal roots, which run in all directions; hence to be successful in killing them they must be cut off or plowed light so as to keep above the layer of horizontal roots. This portion will very soon die when cut off, but if plowed too deep this layer of horizontal roots are only turned over, when they are brought nearer the surface, and will start to grow from the other side of the furrow almost as soon as turned over. Now to be successful in killing Canadian thistles they must be cut off above this layer of lateral or horizontal roots, either by light plowing or by using a cultivator with wide shares that overlap each other, so that no thistles can escape when the land is once gone over. Some thistle roots run very deep, and it would not be an easy matter to get to the bottom of them. To my own knowledge they have sent their roots down some twelve feet into hard clay. But this need not deter any one when the main secret of killing them is known; and that is to keep the thistles cut for one single summer either by light plowing, or by any other means and not let them at any time get more than two or three inches high. Some hold the mistaken idea that the best time to kill the thistles is when they get in full bloom. Now, I contend if thistles are allowed to grow until they get in full bloom the chance for killing that season is entirely gone. The root of the thistle is something like that of the potato, in that each is composed principally of starch. By the time potatoes get in full bloom there will be young potatoes formed, and if these were taken up and preserved from the frost, potatoes could be grown from them the next season. So the very same can be said of the thistle. While the stalk is growing it will be storing away starch or root like the potato, and by the time it is in full bloom it will have stored away sufficient to live through for another season, but on the other hand if they are cut every time when they appear above ground they would be deprived of their breathing power and death to them would be the result. The leaves of a thistle are just as important to sustain life as the lungs are of an animal. An animal breathes through its lungs, and a thistle breathes through its leaves; so no more could a thistle live without leaves than an animal could without lungs.

Now the main thing to be observed is to cut the thistles before they get more than two or three inches above ground. Use any kind of an implement that will suit the var

ied conditions. If meadow or grain fields the spud should be used, and for a root crop the horse and hand hoe; but where the thistles are very numerous and a summer fallow is resorted to as a means of cleaning the land, then the plow or cultivator with wide shares will be very suitable implements.

Considerable can be done towards reducing thistles by just growing a thick crop of red clover, buckwheat or rape. Either of these crops grown thick deprive the thistles from having the full chance to develop. Consequently this will reduce them very much. Or plowing the stubble fields with a shallow furrow immediately after harvest and again later on in the fall, will reduce them considerably and will destroy all seedlings.

I am firmly convinced the only way to kill deep-rooted Canadian thistles in one single season is by cutting them before they get more than two or three inches high. I have found that they will not stand more than four or five cuttings (if carefully done), when they will be entirely killed root and branch even if the roots were down in the ground ten or fifteen feet. But on the other hand just allow Canadian thistles to grow undisturbed until they are in full bloom, then the chance of killing them that season is entirely gone.

BEDDING PLANTS.

By John Graham, Ottawa.

It may not be irrelevant to the subject of "Bedding Plants" to say a few words in regard to the beds in which the plants are intended to grow, as on them depends—to a great extent—success or failure—a pretty scene or a ragged eyesore—as the result of expenditure on and the care of plants. Although it is to be regretted that there is, in cases, not as much of the latter as might be, and the plants allowed to care for themselves after being planted. The consequence of which treatment is that withered leaves, straggling shoots and irregular edgings take the place of what might have been a symmetrical and showy bed, or a gaudy and interesting mixed border.

The soil should be at least one foot in depth, and thoroughly drained. If the natural soil is not good (as is the case in many sections of this city) it should be taken out to the depth aforesaid and replaced with good loam. If such is not procurable, a compost of decayed sods, leaf mould, sand and thoroughly rotted manure will answer the purpose. The quantity of manure should be regulated by the class of plants that are intended to be planted. For foliage or sub-tropical bedding the supply can hardly be too generous. On the other hand, for geraniums—where a mass of bloom rather than a rank growth is the desideratum, a poorer and preferably a somewhat heavy soil will be found more satisfactory.

Supposing the soil now to be suitable: care should be taken not to have too much of it. That is to say, the beds should not be heaped up into mounds resembling inverted camp-kettles, as in such a case the water simply runs off, leaving the roots of the plants dry. The elevation of the bed should not, in my opinion, exceed one inch to the foot in diameter for ordinary soft-wooded plants. Thus a bed twelve feet in diameter may be twelve inches higher at the centre than at the border. For sub-tropical planting the beds should be perfectly flat, and, if the drainage is good, an inch or so below the level of the surrounding grass, so as to get the full benefit of the rain and artificial watering.

Now, in regard to the subject proper, "Bedding Plants," it embraces a much wider scope than can be attempted in the present meagre paper. The following brief list will only include the common and such varieties as have come under my own experience.

We shall, for convenience, divide the list of plants into four different classes, viz, those intended for (1) massing, (2) carpet bedding, (3) sub-tropical bedding, and (4) miscellaneous or border plants.

In the first named lists we shall submit the following varieties, with our methods of propagation.

Ageratum, white and blue. These, being of rapid and stocky growth, make a dense mass quite early in the season, they also do nicely as borders for large beds of geraniums or other plants. For propagation, cuttings are taken from plants in the open ground in September, and are, after being rooted in sand, grown on in pots or flat boxes in the greenhouse, when about April 1st they will have made a good crop of cuttings, which are taken off and the plants thrown out. The cuttings are again, when rooted in sand, potted and grown on, preferably in a hot bed, until the planting-out season.

Achyranthus. Red of different shades, and yellow, are used chiefly as edgings. Propagated similarly to the preceeding.

Anthemis Coronaria, or Golden Double Marguerite. A showy plant about eighteen inches high, bearing rich golden yellow flowers in the greatest profusion. Propagation same as for ageratum.

Begonia. Tuberous rooted; is becoming very popular as a bedding plant for partially shaded situations, the size and gorgeous colour of the flowers being marvellous. These are grown from seed, but for the ordinary planter the better plan is to obtain the tubers from some specialist. The tubers are started in small pots during March and April, in a warm window or greenhouse, being shifted into larger pots as the roots grow, until it is time for planting them out, which in this latitude is never earlier than June 1st. After the flowers and foliage have been partially destroyed by frost in the autumn, the plants are dug up with considerable soil adhering to the roots, and stored away in a dry, warm and airy place to dry and keep through the winter.

Centaurea—*Gymnocarpa* and *Candidissima*—also called "Dusty Miller." These are used almost exclusively for bordering. They may be propagated either from seed or cuttings, the former being much the easier method. The seeds of *C. Gymnocarpa* should be sown in January or February, and when the plants are large enough to handle, transplanted into boxes containing about two inches of soil, then in April potted into three inch pots, and so grown until wanted. *C. Candidissima*, being of slower growth, the seed should be sown in September and given the same treatment as the former to produce plants large enough for the following spring.

Coleus. These are grown for their foliage only and make very effective bedding plants. Propagation same as for ageratums. Being extremely tender they should be grown in a temperature of at least 60°, and should receive frequent applications of some insecticide during winter or the crop of mealy bugs will be much larger than that of cuttings. It is unwise to plant them out before June 1st, as if they even get chilled it takes them quite a while to recover their beauty and to start to grow again.

Daisy. "Wee, modest, crimson tipped flower." These are planted to a considerable extent and are especial favorites for cemetery work. They thrive best in a moist and slightly shaded situation. They may be raised from seed, but the larger named varieties, such as Snow Crest, Snow Flake, etc. (in which the crimson tips are dispensed with), are produced from cuttings or division of the plants.

Geraniums. These are the bedding plants *par excellence*, the number planted annually far exceeding that of any other class. Nothing can be more dazzling than a bed of scarlet, or even mixed colors. Their name is legion, and to enumerate the varieties is not within the province of this paper. Propagation is by means of cuttings. The plants of which the greatest number are sold are known to the trade as four inch, that is plants in four-inch pots. The method I follow to produce them—which although not offered as the best is in my opinion the simplest—is as follows: The cuttings are taken from the plants in the garden during the first week in September, when both cuttings and flowers are plentiful. They are cut about three inches long and all the leaves *broken* off except the centre one. I emphasize the word "broken," as the cuttings can be made cleaner in that way than if trimmed with a knife, any stubs of the leaf stems left on being very apt to rot at that season, and the disease spreads to the stem of the cutting and will cause a considerable percentage of them to be lost. They are placed in coarse sand in rows about two inches apart and about one and a half in the rows. They are well pruned in, watered and lightly shaded for a couple of weeks when the sun

is shining. The sooner a gentle bottom heat is applied the smaller will be the loss from damping off. When rooted they are potted into two and a quarter inch pots, which are placed close together on sifted coal ashes. As the plants begin to grow the tips are pinched off, and later they are gone over and all the larger leaves taken off, in order to prevent them from being drawn by crowding. The crowding of them is of course simply to economize space. In February they are shifted to three-inch pots, and in April they are again changed into four-inch pots, and then placed in frames with forest leaves or some such material packed between the pots to prevent them drying out too quickly. They should also be moved occasionally to prevent them from sending their roots through the bottoms of the pots.

GAILLARDIA, *Picta Lorenziana*, etc., though annuals, are very showy, and continue to bloom until quite late in the autumn. They should not, however, have too prominent a position, as if the season is moist they are inclined to grow too luxuriantly to produce many flowers.

NASTURTIUMS. Tom Thumb or dwarf varieties, also annuals, make pretty and cheap bedding plants, their symmetrical shape and rich flowers giving them a very pleasing appearance.

PANSIES. "Soft-eyed and winsome and sweetly confiding, beautiful pansy, the gardener's delight," are probably next to geraniums the most popular plant sold in spring and deservedly so, as the size of the flowers and wonderful markings which are now attained combine to make them both interesting and beautiful. They are produced almost exclusively from seed. which may be sown either from July 1st to September 1st, or from January 1st to April 1st. Plants started on the former dates are wintered over in cold frames, those sown in July being transplanted four inches apart. These will make much larger plants and consequently have a greater profusion of bloom in spring. They have a tendency to—to use a vulgarism—"peter out" before the summer is nearly over. Spring grown plants, on the contrary, will bloom and flourish throughout the season. The seedlings of the spring grown plants are managed as are other seedlings until April or until spring is sufficiently advanced to permit their being planted in cold frames, as they are then, on being taken from the greenhouse, as delicate as any other plant. They are planted four inches apart each way and given an abundance of water until sold or planted out.

PHLOX DRUMMONDII. This annual may also be included with bedding plants. The separate colors especially making a very gaudy bed.

PETUNIAS are also very showy; the single varieties being more so than the double. The singles are commonly known as annuals and are produced chiefly from seed, while the majority of double-flowering plants sold are raised from cuttings.

VERBENAS. While closing the list of bedding plants intended for masses, these are not by any means the least important. They thrive best on rather heavy soil, which, to produce the best results, must be well fertilized. They are propagated either from seed or cuttings; the former method producing more vigorous plants, while the latter has the advantage of producing earlier bloom and consequently better selling plants and at the same time only such colors as the grower may choose to perpetuate.

The number of varieties of plants suitable for carpet bedding is more limited, and I shall submit the following list: Alternantheras, in varieties, *Achyranthus Biemullieri*, Alyssum, Tom Thumb, Echeverias, Golden Thyme, *Mesembryanthemum Cordifolium*, Lobelia, Pyrethrum and *Sedum Carneum Varugata*. Of the above Pyrethrum is grown from seed, Echeverias from offshoots, and the remainder are propagated from cuttings in the usual manner and are grown either in pots or in shallow boxes until wanted for planting out.

The third class of plants, those known as sub-tropical, are fast gaining in popularity and they are well worthy of more extensive planting, for nothing can be more gorgeous, interesting or decorative than beds, borders or individual plants of this class. Many seem to have the idea that this is a highly expensive style of bedding plants. It is a mistaken one, however, as a bed of Cannas, Caladiums, etc., will not cost any more than

a bed of similar size planted with geraniums, coleus or kindred plants. Or, for instance, what can be more effective at so little cost as a Castor Oil Bean? So we shall head the list with

Castor Oil Bean, *Ricinus*. These being annuals are raised from seed which may be sown from April 1st to the middle of May. If sown early they should have a good bottom heat as the seeds are apt to rot in a low temperature. The seedlings should be potted when quite small as the roots are devoid of fibre, consequently the plants are somewhat difficult to handle. If wanted for the centre of a bed *R. Cambodgiensis* or *R. Gibsonii* are the preferable varieties, or if a huge specimen is the desideratum *R. Borboniensis* in rich free soil and with proper feeding will fill the bill.

Of Cannas there is now an almost endless variety, the *furore* being for the new dwarf large flowering varieties on account of their brilliant colors and conspicuous flowers, but for bedding plants the older and taller growing varieties are fully as effective and as yet less expensive. They are propagated by division of the roots.

Celosia Pyramidalis is a plant that looks gorgeous in the autumn at small expense

Caladium Esculantum used either as a border to a canna bed or planted singly will certainly attract notice and admiration for their great, leathery, drooping leaves. The summer season here however, does not last long enough to ripen the bulbs, as they rarely show any vitality in spring, the consequence being that new bulbs have to be imported annually. These are started in pots in a hot-bed or a warm corner of the greenhouse about April 1st.

Musa Ensete or Abyssinian Banana is another grand plant, showing to best advantage when planted individually on the lawn and given an abundance of water during the hot weather. It is propagated only from seed which should be soaked for several days in tepid water before sowing as they are exceedingly slow to germinate.

Nicotinas are also cheap and effective. Draccnas, *Ficus elasticus*, Lalania Borbonicas, Kentias, Arecas, Phœnix Rupicolas and other plants that have done service in the dwelling house during winter may be either plunged to the rim of the pots or planted out in sheltered and well shaded situations where they will recuperate and at the same time adorn the places in which they are set.

The fourth class, miscellaneous or border plants, forms a very important and desirable feature of the flower garden. Not the least to be said in its favor is the fact that a continuous supply of flowers may be had for house decoration during the summer and fall months. The different plants should be interspersed promiscuously on the border. The only study as to the position of plants being that if the border is isolated the tallest growing plants should be placed in the centre, the others gradating to the sides. If the position of the border is contiguous to a wall or fence it should be one-sided and the plants gradated from the back.

In the list of plants suitable for this purpose may be included all the foregoing, with the exception of the palms, together with Asters, Abutilons, Achillias, Amaranthus, Antirrhinums Monthly, Marguerite and Border Carnations, Dahlias (these, however, do not seem to give general satisfaction around Ottawa), Dianthus, Gladioluses, Heliotropes, Feverfews, Hollyhocks, Helianthus (the multiflorus variety being particularly desirable), Lemon Verbena, Alcysia Citriodora (this old fashioned plant should be in every collection on account of its perfume), Mignonette, Poppies, Portulaca, Saxiglosis, Sweet Peas, Stocks and others.

The plants in the above list, consisting of both annuals and perennials, are all well known and the methods employed in their propagation are synonymous with those already described.

It is not my intention to recommend the planting of each and all of the above in a bed or border, as complexity in gardening, as in other arts, is not always indicative of taste. A selection may however be made from it that will adorn and cheer the home and make life happier in every respect.

PINES AND FIRS.

By Lieut.-Col. White, Ottawa, Ont.

Everybody has a hobby of some kind or another—some one object to which he devotes more of his time than to any other object; and it so happens that I have a hobby. Indeed, if I were not contradicting the definition of a hobby which I have just given, I should say I had two or three at least; but the particular one to which I now refer is a weakness for evergreens, especially pines and firs. And so I propose to devote a few minutes to the consideration of Pinaceæ, pines and firs. I have often thought that much more use might be made of them in Ottawa than is at present the case, and I have experimented a little in that way as an amateur myself. I have always considered that the principal use of amateurs is to try experiments for the benefit of other people—that is of the public at large. If that is not their mission in this life, then I don't exactly see where they come in. Now, in pursuance of this idea, and carrying out the hobby I referred to, I commenced some time since planting pines and firs, on that piece of barren sand where I live, sand so barren that when I first went there Mr. George Leslie, the nurseryman of Toronto, taking up a handful and examining it closely, said to me "Well, there is one thing to be said about this, that you will never get anything out of it that you do not first put into it."

I began with *Pinus Sylvestris*, the Scotch Pine. When about ten feet high, someone used the ground around as a dumping ground for ashes until they were about eighteen inches deep all around the stem, and for some distance on either side. The tree died and I always attributed its loss to the fact that the ashes were piled all around the stem, but I should like to have an expression of opinion on that point. I have another specimen which is doing well, and has borne cones for two or three years.

Next on my list comes *Pinus Austriaca*, or Black Pine. Of this kind I have four, two of them about twenty feet high, and two others which would have been, had not some person some three or four years ago cut six feet or more from the top of each—probably for Christmas trees. Since that the upper branches have all grown inwards, forming a sort of dome over the injured part and completely hiding it from view.

Pinus Cembra, the Siberian Stone Pine. Of this I have two specimens, one well shaped and now about eight feet high; the other was unfortunately nearly destroyed by a vagrant cow and is spoiled as a specimen. This variety grows very slowly and is therefore useful only as an ornamental tree, but it makes a very pretty variety. Its compact, erect growth, and the silvery green foliage give it a distinctive character. It appears perfectly hardy and entirely indifferent to soil or situation.

Pinus Inops, also known as the Jersey Scrub Pine, is also a very slow growing and somewhat straggling bush rather than tree. It is useful merely as a variety to break the monotony of the other kinds. The young shoots have a violet tinge: it seems to be perfectly hardy.

Pinus Mugho.—This variety differs very little in appearance from *Pinus Inops*, it is a native of Austria and may almost be considered a European variety of Inops. It is perfectly hardy and of slow growth.

Pinus Peuce, of which I have also a specimen, is the Greek variety of *Pinus Strobus*. It is found in Macedonia and makes a very pretty variety indeed, it has very fine silvery green foliage and compact form of growth.

Pinus Resinosa, the red, or, as it is sometimes called, the "Norway Pine" comes next on my list. This as a native of our own district is of course well known to us all, but I fear that we are apt to regard it simply as lumber without stopping to consider how valuable a variety it is for ornamental purposes. The red pine of the forest and the red pine of the aboretum are altogether different things. In the one case we have a long pole without branches until the head of the tree is reached, in the other an ornamental tree of regular shape closely resembling the Austrian Pine in leading characteristics.

Pinus Rigida, the Pitch Pine, and *Pinus Banksiana*, the Northern Scrub Pine, have both been tried, but with me they have been failures. Except as varieties I do not think that either is particularly desirable for cultivation.

I have now exhausted my list with the exception of the universally known White Pine, *Pinus Strobus*, a tree of which the history is hidden in the mists of antiquity. It was well known in the days of Pliny, who died A.D., 79, and is referred to by other writers of antiquity. It exists in some variety or other in Europe and in Asia as well as in America. *Pinus Peuce* in Greece is a form of Strobus, so are *Pinus Excelsa* of the Himalayas, and *Pinus Devoniana* of Mexico. This Pine is sometimes called the Weymouth Pine, having been introduced into England early in the 18th century by the Earl of Weymouth and extensively planted by him on his estate in Wiltshire.

Having disposed of the pines I will now say a few words about firs, and only a few, as my experience with them has been more limited than with the pines.

First then comes *Abies Canadensis*, the Hemlock. This is a case in which I fear familiarity has bred contempt, for although one rarely sees it grown as an ornamental tree it is really one of the most beautiful of the firs, its rich silvery green foliage, pendant branches and the graceful form make it almost a rival of the celebrated *Cedrus Deodara* of the Himalayas.

Abies Alba, the White Spruce. This as another well-known native, needs only to be mentioned as a variety which from the pale green of its foliage makes it a desirable tree to intermix with those of a darker green.

Abies Balsamea, the Balm of Gilead Fir as it is sometimes called, is also a well known —perhaps the best known of our native firs. It is a compact growing tree, and well adapted for planting; the cones are violet purple.

Abies Excelsa, the well known Norway Spruce, is in the opinion of many by far the handsomest of the spruces. It is so extensively grown, and adapts itself so easily to almost every situation and soil, that it has become a universal favorite and is probably more generally planted than any other evergreen which has been introduced. It has one very great advantage over most of the other varieties in maintaining dense foliage down to the ground, many other varieties have a tendency to die off in the lower branches.

Picea Pichta, the Siberian Fir, is a very handsome compact growing tree, its foliage retaining its beauty down to the ground. I had for some years a very beautiful specimen of this fir; it grew to a height of about fifteen feet, when for some reason which I have been unable to discover, it turned brown and died. Its foliage is light green with silver on the under surface.

Picea Nordmanniana, Nordman's Silver Fir, a native of the Crimea, is very distinctive in its character, and if it would stand our climate would be a very valuable addition to our firs. With me it has been a complete failure, very much to my regret.

Abies Abiesquiana.—This is a pretty little fir, but as the only specimen I have tried died during the first year I am not in a position to say much about it.

Juniperus Virginiana, the Red Cedar, is a well known native, and is well worth cultivation. It forms a compact growing, handsome tree, and bears pruning remarkably well.

Juniperus Communis, like *Taxus Baccata*, is a low shrub which can only be made available in suitable localities, and can hardly be considered as available for ornamental purposes.

RECORD OF MR. JAMES WHITTON'S EIGHT DAIRY COWS.

The facts and figures here presented have been furnished by Mr. James Whitton, Wellman's Corners, and give the record of eight cows, all aged and full milkers, for the year beginning April 1st, 1892, and ending March 31st, 1893.

Cheese.

During the season of cheese-making the milk was sent to Plum Grove cheese factory, the quantity being as follows:

April	4,293 lb.	August	8,033 lb
May	8,193 "	September	7,796 "
June	9,844 "	October	7,527 "
July	8,209 "	November	5,358 "
Total			59,253 "

Income.

The income from the above is thus calculated:

Cash, per cheque	$505 00	
By-products, calves and hogs	80 00	
Total		$585

Expenditure.

For April and May:
Daily ration, 40lb. of ensilage at $1.25 per ton.
Wheat meal at $16 per ton, 6 lb. each.
Green oats cured, at $10 per ton, 10 lb. each.

Cost for 61 days	$60 08	
For June, July and August:		
Fourteen acres of pasture at $2 per acre	$28 00	
Wheat meal at $16 per ton	35 33	
Cost for 92 days	63 33	
For September, October and until 23rd of November:		
After grass, ten acres at $2 per acre	$20 00	
Green oats and corn stalks	39 84	
Cost for 84 days	$59 84	
Total cost during cheese season		183 25
Net gain over cost of feed during cheese season		$401 75

Winter Dairying.

Total amount of milk sent to Wellman's Corners Creamery ..... 20,000 lb.

Income.

Received from creamery	$193 00
Value of by-products	75 00
Total	$268 00

Expenditure.

Daily ration, 40 lb. of ensilage at $1 per ton.
4 lb. of oat chop at $16 per ton.
5 lb. of bran at $12 per ton.
6 lb. of green oats cured at $10 per ton.
Cost per day of eight cows, 95 cents.

Total cost for 128 days	$121 60
Net gain over cost of feeding during the four months	$146 40

Summary.

Following is a summary of the year's business for the eight cows :

Quantity of Milk.

Sent to cheese factory	59,253 lb.
" creamery	20,000 "
Total	79,253 "

Income.

From cheese making—cash and by-products	$585 00
" creamery " "	268 00
Total	$853 00

Cost of Food.

During the cheese season	$183 25	
" creamery period	121 60	
		$304 85
Net gain over cost of food		$548 15

In the above statement no account has been taken of the value of the manure on the one hand, and the cost of attendance and all other expenses over and above that of the food on the other.

Another Interesting Milk Record.

Under date of January 22nd, 1894, Mr. Whitton writes : I cannot give you an account in full for the past season, but will give you the quantity of milk from April 1st, 1893, to January 15th, 1894, (up to within one week of the date of writing) given by ten cows, three of which were two year old heifers, one a three year old and one cow farrow, which is milking yet—making a very broken lot. The figures are :

April	6,203 lb.	November (up to 24th)	4,595 lb.
May	9,974 "		
June	8,217 "	Sent to cheese factory	50,225 "
July	7,685 "	" creamery	5,613 "
August	7,851 "		
September	7,096 "	Total lb. of milk	60,838 "
October	6,004 "		

These cows were kept on four acres of pasture from June 10th to August 10th, soiled with green clover and peas, and oats cut green.

THE SILO AND ENSILAGE.

By Andrew Elliott, Galt, Ont.

In every kind of business and more particularly that of the farmer, the secret of success and accumulation is economy and saving. Saving in stock feeding can be effected in two ways: first, by increasing the return of food produced, and second by making the utmost of the food product when produced.

One of the more recent and effectual means of increasing the stock-carrying capacity of the soil is by the growing and storing of various plants in the silo. The process of preserving food in the form of ensilage has been practiced for a little over twenty years, and has been for the last ten years rapidly gaining in popularity.

The silo is simply an air tight box into which the material is put, while in a green and succulent state, and it is preserved by the same process as the careful house-wife preserves her fruit by canning. In both cases means are used to expel the air and destroy the germs of decay contained in the article, and afterwards prevent their reintroduction into the mass.

The shape of the silo will, to a great extent be fixed by the position in which it is to be placed and by its surroundings. With basement barns it ought to be carried down to the level of the feeding floors, if possible in such a position as to enable the feeder to run his truck directly from the silo to the stock to be fed. For economy of space and material used in construction, a round silo is undoubtedly the best. Much lighter studding can be used, as when the sheeting is nailed on, each individual board acts as a hoop and corners are also avoided. An eight sided form is perhaps the next strongest in proportion to material used. The material used in construction may be of wood, stone, brick or concrete. In my opinion, however, the three last ought to be sheeted with wood, as the silage does not heat to a sufficiently high temperature to expel the mould germs when touching the cold stone or brick and decay is the result. For a square wood silo a solid stone foundation is required; the studs 2x10 by 2 feet apart firmly toe-nailed or mortised into the sill; the outside may be clap-boarded or sheeted and battened. The inside, one ply of light inch lumber firmly nailed to the studs, then a sheet of tar paper over which an inside sheeting of matched and planed inch lumber, boards not over seven inches wide. It is well to fit an 18-inch plank snugly into the corners. Do not fill in any spaces with saw-dust or other material as it only tends to decay. An opening in one side must be left for the purpose of emptying the silo, into which sectional doors must be fitted to lift out as required. In the whole process of building the utmost care must be taken to have the silo as nearly air tight as possible, as upon this depends the success or failure of the silo. With regard to the size, that will depend on the amount of stock kept and the quantity of corn grown. It is to be preferred to have two medium sized silos rather than one large one. It is also desirable to have the silo as deep as possible in order that it may settle more compactly. Care must, also, be taken to have drainage from the bottom, either artificially or naturally. It is not necessary to have a cement floor if the ground is naturally dry or drained. For a farm of 100 acres there ought to be a silage capacity of not less than 100 tons. A cubic foot of settled ensilage weighs about forty pounds. Therefore, allowing for settling, a silo to contain 100 tons will require to be 13x13, 30 ft. deep, or 12x16 and 26 ft. deep. A 50-ton silo may be 10x12 and 22 ft. deep (less than a 50-ton silo I would not recommend). Should a more oblong one be preferred it might be 10x24, 22 ft. deep. This, however, ought to have a partition through the centre, making two 10x12. A round silo 15 ft. in diameter and 25 ft. deep will hold about the same amount. In order to fill a 100-ton silo with corn, about ten acres of corn ought to be grown. If a fairly good crop seven or eight acres will fill such a silo. It is well, however, to err on the safe side, as the surplus corn can be husked and the stalks cut and fed to the stock. If we estimate the time of winter feeding at six months, a silo containing 100 tons will feed 30 head of cows, between 35 and 40 lb. of ensilage a day for that time—a sufficient amount, if combined with the coarse feed grown on the farm and half the usual amount of grain, to keep the cows in full flow of milk.

The corn plant is undoubtedly the plant *par excellence* for the silo. Contrary to the belief of many it can be grown to perfection in every county of Ontario on well cultivated, well drained land. Our experimental farms have done much good in testing the various kinds of corn, until we have, now, no localities where some of the kinds tested will not mature sufficiently for ensilage purposes. In order to have the best quality of ensilage the corn requires to be fairly well matured, and it is well to plant a certain per cent. of the corn of those varieties that will mature the grain perfectly to mix in the silo with the more vigorous and later varieties. It gives richness to the ensilage and requires less grain to be fed with it.

The Thoroughbred White Flint and the Longfellow are good flint varieties, while of the large kinds those ought to be chosen which are early enough to fairly mature the grain. The Leaming and Pride of the North, together with the Huron Dent are suitable for the colder parts of the province, while in warmer parts the Mammoth Southern Sweet and Red Cob Insilage, both of which are very heavy croppers, are suitable.

Having selected suitable varieties to sow, several things are necessary to insure a good crop. Plant early; fall plowed land well manured, brought to a fine condition with cultivator and harrow in the spring, or a one year old clover sod manured, plowed in the spring and harrowed fine. Sow as soon as the land is warm; if wet and cold there is great danger of the seed rotting in the ground.

I find that the quickest way to sow is with a tin tube six foot drill. Sow in rows three feet apart setting drill to sow two and one-half bushels to the acre; by sowing with two tubes one-half bushel to the acre will be sown. As soon as the plants are fairly up harrow once across the sowing; continue the harrowing at intervals until the plants are eight inches high. A few plants will be pulled up, but plenty will be left. The harrowing kills weeds and promotes a vigorous growth of the young plants, and it will also pay well to give the field a top dressing of plaster of Paris (150 or 200 lb. to the acre) sown broadcast as soon as the plants appear. At the first hoeing, thin the plants out to about six inches in the row. A very serious mistake is often made by allowing the plants to grow too thick. Sufficient space ought to be left to allow the sun's rays to fall on every plant. Corn likes the sunshine and will not produce the best quality of food if deprived of it. Keep the cultivator going until the corn is as high as the horse, being careful to cultivate shallower as the corn grows; a deep, close cultivation checks the growth by cutting the roots. The corn is ready to cut when the grain is beginning to glaze. If cut too soon when the stalks are quite immature a sour ensilage is the result. On the other hand, there is danger of frost if allowed to stand too long. Should it get frozen do not be discouraged. Get it into the silo without delay; it will not be materially injured.

I cut with the sickle, lay in armfuls, and if the weather is catchy draw at once to the silo, and if it gets wet put it in, the silage will be all right. For drawing to the silo I use truck waggons with a flat bottom, 16 feet long, and a stake in each corner, throwing the corn across the waggon. As much can be loaded on as a team will draw. A powerful ensilage cutter with carrier attached is required. I use Watson's make driven with an engine or horse power. I prefer to cut three quarters of an inch long, for by cutting that length the heavy stalks will be shattered and the mass settles more perfectly. I am in favor of filling slowly, by slow filling the ensilage heats up to a higher temperature and sweet ensilage is the result. I do not say that any ensilage is absolutely sweet, but that made from well matured corn allowed to heat up to from 130 to 145 degrees will be about right, having a smell something like an old molasses barrel, while that from immature material and heated less smells decidedly sour.

To fill a 100-ton silo, with everything handy, will require about seven half days: it will give employment to two teams and teamsters, two loaders in the field, three waggons, two men to feed the cutter, spread and tramp the silo, and one engineer or driver. Of course a smaller force will do, only requiring longer time. In filling mix the heavy parts and the leaves, keeping the centre high and the outside and corners well tramped. After the silo is filled put a foot of marsh hay or cut straw (watering the straw will help it) on the top, tramping well the surface every few days for three weeks, when it will require nothing more until opened.

If feed is required, begin feeding at once, being careful to rake over the whole surface every day, as there is a tendency to spoil when exposed to the air undisturbed for a few days. In feeding I believe the best way is to feed directly from the silo; it may, however, be mixed with cut straw or chaff and allowed to lie for twelve hours. By following this course a certain amount of acid is developed which is avoided by direct feeding from the silo. A good deal has been said about the feeding value of ensilage as compared with hay. If we allow the cows and young stock to be the judges they will invariably select the ensilage in preference to the best hay that can be offered. Cows when on the very best grass greedily eating ensilage when tied in to milk. During the winter cows fed on ensilage will continue to give a full allowance of milk of the best quality.

As a feed for idle and young horses it is all that can be desired, keeping them healthy and bringing them through the winter at the least possible cost. I am not in favor of feeding ensilage to sheep, for while it will undoubtedly feed sheep rapidly, yet their health does not appear to be as good as that of those fed on turnips and hay, a peculiarity being that while they may be extremely fat their wool is weak and easily pulled out in handling, precisely like that of a poverty sheep.

In localities where turnips can be grown successfully, I would not advise their abandonment for ensilaged corn. I believe there is ample room for them both on every farm; for young cattle, sheep and hogs, and to a limited extent for cows, the turnip has a place on every farm. As dairying extends, the necessity of the silo becomes more and more apparent, and I am certain that the judicious use of the silo and corn plant will in a short time double the stock-carrying capacity of the land, and that too without seriously reducing the amount of grain grown. As the art of preserving food in the silo becomes better known, I have no doubt that clover will be extensively used as ensilage. A few acres of clover cut into the silo would bridge over the time of drouth which generally comes in July and August before the corn is mature enough for profitable feeding and keep the cows at paying work at the least possible expense.

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OF

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Kent, W	John Clarkson	Chatham.
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LIST OF SECRETARIES.

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Renfrew, S	Geo. McIntyre	Renfrew.
Russell	W. R. Craig	Russell.
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Wellington, E	George Cushing	Kenilworth.
Wellington, S	P. Mahon	Aberfoyle.
Wellington, W	James McEwing	Drayton.
Wentworth, N	Joseph Stevenson	Freelton.
Wentworth, S	Erland Lee	Stony Creek.
York, E	J. C. Clark	Agincourt.
York, N	A. E. Stair	Newmarket.
York, W	R. L. Crawford	Richview.

* This Institute has branches at Port Carling and Utterson.

REPORT

OF THE

GOOD ROADS ASSOCIATION

OF THE

PROVINCE OF ONTARIO.

(PUBLISHED BY THE ONTARIO DEPARTMENT OF AGRICULTURE, TORONTO.)

PRINTED BY ORDER OF THE LEGISLATIVE ASSEMBLY

TORONTO:
WARWICK BROS. & RUTTER, PRINTERS, ETC., 68 AND 70 FRONT STREET WEST.
1894.

REPORT

OF THE

ONTARIO GOOD ROADS ASSOCIATION.

To His Honor the Lieutenant-Governor of Ontario:

The undersigned has the honor to present herewith the report of the first convention of the Ontario Good Roads Association, held on February 9th, 1894; also an Appendix containing two bulletins on Road-Making, issued by the Ontario Department of Agriculture.

Respectfully submitted,

JOHN DRYDEN,
Minister of Agriculture.

TORONTO, June, 1894.

OFFICERS FOR 1894.

President ..... A. PATTULLO ..... Woodstock.
1st Vice-President ..... J. F. BEAM ..... Black Creek.
2nd Vice-President ..... A. P. McDOUGALL ..... Melbourne.
Secretary-Treasurer ..... K. W. McKAY ..... St. Thomas.

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JAS. BEATTIE ..... Campbellton.
JAS. SHEPPARD ..... Queenston.
P. MAHON ..... Aberfoyle.
J. McEWING ..... Drayton.
J. C. JUDD ..... Morton.
ALF. HUNTER ..... Harrowsmith.
W. JELLY ..... Shelburne.
F. REID ..... Annan.
D. DERBYSHIRE ..... Brockville.
A. MACDOUGALL, C.E ..... Toronto.

LIST OF DELEGATES.

Names of delegates who registered when attending Good Roads Convention at Toronto on February 9th, 1894:

Name of Delegate.	P. O. Address.	Association represented.
Allan, James	Churchill	South Simcoe Farmers' Institute.
Ballantyne, F.	Kirkwall	Beverly.
Barnhard, M. B	Black Creek	Welland Farmers' Institute.
Beatty, James	Dutton	West Elgin.
Beam, J. F	Black Creek	Western Dairymen's Association.
Bell, Jas. A.	St. Thomas	County Council of Elgin.
Brierly, Jas. S	St. Thomas	St. Thomas *Journal*.
Buckton, L.	Welland	Pres. Farmers' Institute, Welland.
Buckner, R. E. H.	Toronto.	
Birdsall, F	Birdsall	East Peterborough Farmers' Institute.
Campbell, A. W.	St. Thomas	City Engineer, St. Thomas.
Clark, J. C	Agincourt	East York Farmers' Institute.
Cohoe, John E.	Wellandport	Monck Farmers' Institute.
Dean, Prof. H. H	Guelph	Ontario Agricultural College.
Donley, H. B	Simcoe.	*Norfolk Reformer*.
Eagle, Harold	Attercliffe	Western Dairymen's Association.
Fisher, George E	Burlington	Burlington.
Forester, A. S.	Oakville.	
Garbutt, H. C.	Lakefield	West Peterborough Institute.
Goodwillie, Hiram	Welland	Welland Farmers' Institute.
Hill, James	Wellandport	Monck Farmers' Institute.
Howell, W. N.	Carlow	West Huron.
Hunter, W. A.	Toronto	C. W. A., Toronto.
Hunter, Alf.	Harrowsmith.	
Judd, J. C	Morton	South Crosby Township.
Mahon, P.	Aberfoyle	South Wellington Farmers' Institute.
Marsh, G. F	London	*Farmers' Advocate*.
Monteith, Nelson	Fairview	Township Council, Downie.
Mortimer, C. H	Toronto	*Architect and Builder*.
McKay, K. W.	St. Thomas	*Municipal World*.
McGregor, A. D	Rodney	West Elgin.
McEwing, James	Drayton	Wellington Farmers' Institute.
McDougall, A. P	Melbourne	West Middlesex.
Pattullo, A	Woodstock	*Sentinel Review*.
Pedlar, S.	Toronto.	
Riky, R. A	Shelburne	Shelburne Village.
Robson, William	Whitby	Town of Whitby.
Reid, Frank	Annan	North Grey.
Sipes, J. N	Blair	Waterloo Township.
Stone, B	Stayner.	
Sheppard, James	Niagara	County Council of Lincoln
Wilson, R	Cobourg	Town Council.

REPORT

OF THE

GOOD ROADS ASSOCIATION

REPORT OF CONVENTION.

In response to an invitation issued by the authority of the Canadian Institute Toronto, a convention of persons interested in the subject of public roads was held in the assembly room of the Institute, on February 9th, 1894.

Moved by Mr. BEAM, seconded by Mr. JUDD, that Mr. Andrew Pattullo take the chair. Carried.

Moved by Mr. HAMILTON, seconded by Mr. PUCKTON, that Mr. Alan Macdougall act as secretary *pro tem.* Carried.

Mr. PATTULLO: I thank you very sincerely for the courtesy you have extended to me in placing me in this position. I am afraid the attendance will not be very large this morning because of the weather, but I hope that no one will be discouraged on that account. For my own part I feel that the attendance is quite as large as I expected. I would remind you that nearly all great movements in the world's history have begun in a very small way. I think we may safely expect the blessing that is said to rest upon people when even a few are gathered together in a good cause. We have a good cause in the question of road reform, and I have no doubt that a meeting beginning even in a small way will lead to great results.

My name has been mentioned as one of those who had something to do with the organization of this meeting. When the matter of a roads convention was first suggested I did not expect that at our initial meeting we would have a very large number of people. Our thanks are due to the Canadian Institute, which, as an independent body, took upon itself the initial work and expense of calling this meeting together. When the suggestion was made in the public press that the time had come for organization, the Canadian Institute came forward, and, after some conference with myself and others, undertook to call this meeting. In so doing it has done a public service, as has been the case in many other instances. I did hope that at this initial meeting we would perhaps have more representatives of the public bodies than we are likely to have, although it is possible that we may have a larger representation before the meeting is over. It has occurred to me, however, that perhaps the notice sent out to the different public bodies throughout the country was a little too brief and did not sufficiently explain the objects of this meeting, the aims of those who had called it together, and the results that we hoped to achieve in reference to this question of road reform. Public bodies are sometimes a little chary of new movements; and I am afraid that our friends of the municipal councils and other bodies have for some cause neglected to send delegates to this meeting when it would have been in their interest to do so.

If you will permit me, I will read you a brief paper setting forth my views on the subject of road making:

ROAD-MAKING.

By Andrew Pattullo, Woodstock.

It has been said that good roads are at once the index and the agent of civilization in every country. Judged by this standard, Canada is a generation behind many European countries in which the average of intelligence and of comfort is much below that of our people. It is not necessary to stop to enquire why, in a country so progressive, with such resources and already so much accumulated wealth, with a population superior in average intelligence to, perhaps, any other community of equal numbers on the globe, our people have so sadly neglected the improvement of their rural highways. Perhaps we have been so busy clearing the forests, making homes and building railways that we have forgotten the common roads which contribute as much as any other influences to the comfort, the prosperity and the intelligence of any community. At any rate, our rural roadways are no true index of the material progress and civilization of the Canadian people; and it is high time—indeed, it is far past the time—when a united and general effort, embracing the whole country, should be made to improve them.

The problem of road-making is as old as the race. And it is one which was solved centuries before the Christian era. The principles of road-building were known and practised by the Romans, as they were centuries before the voyage of Columbus by the inhabitants of the southern portions of the South American continent. Monuments of the skill of these past generations still remain as silent reminders that with all the boasted progress of the nineteenth century we have neglected, if we have not forgotten some of the arts of civilization which have come down to us through long centuries of the past.

That the people of this country are conscious of having neglected their interests by neglecting to make good roads, is shown by the fact that for a few years past there has been a somewhat general and persistent agitation for road improvement. Not that the question is new in these later years to the generation of Canadians now living; because there have always been road reformers in this province, many of whom have not only had very clear ideas as to how good roads should and could be made, but have done excellent practical work in securing improvement. But perhaps for the first time in the history of the country the demand for good roads has, during the past year or so, assumed the proportions of something like a systematic and organized agitation likely to secure general and practical results. It has been kept up with a vigor and persistency which has forced it on public attention, and made it one of the live questions of the present day. While this agitation has not yet secured many tangible results either in the way of improved methods or improved systems of road-making, it has prepared the way for both. It has attracted the attention of numerous public bodies, especially of those representing the farmers. For instance, the Western Dairymen's Association passed a strong resolution in favor of road reform at its annual meeting a year ago. As the result of a request made by that body, the Provincial Minister of Agriculture took the initial in issuing from his department, for general circulation, bulletins on the subject. The columns of the press throughout the province have teemed with articles on the subject. There are two press agencies in this city which supply country newspapers with much of the matter which now appears in their columns. Influence has been brought to bear on both of these, with the result that regular pages of matter on roads are issued by them, much of it illustrated and of a most valuable character, and which is now appearing daily and weekly in nearly all the country newspapers

of Ontario, and in some of the metropolitan journals. Thus valuable preliminary work has been done in a somewhat systematic way, and which has been preparing public opinion for more definite action in the line of reform.

But our neighbors in the United States—although behind us in many respects, as you know—have been going ahead of us on this question. Among them road improvement may be said to be a national, a state and a local question throughout the length and breadth of the Republic. National, state and local conventions have been held to discuss it. An enormous petition, signed by a couple of hundred thousand or so, was recently presented to Congress, with dramatic incidents, which our neighbors love so well, asking that a Road Department should be established in connection with the United States Department of Agriculture. There is now a National Road Enquiry Bureau over there in charge of an intelligent and enthusiastic advocate of the cause, General Roy Stone, and which is doing a vast amount of good work. As you know, there was a Good Roads exhibit at the World's Fair, where all the latest machinery for road improvement was on exhibition. This exhibit must have done a great deal to educate visitors to the fair on the all-important question of road making. In the Commonwealth of Massachussets legislation was passed a couple of years ago appointing a permanent Highway Commission, the report of which is a book of very great value. There is a State League for Good Roads in New York; and the idea of state and county leagues is spreading throughout the whole country. To show the extent to which the demand for road improvement has taken hold of the American people, it is interesting to note that no less than fourteen States of the Union have recently passed new laws on the subject; while others are moving in the same direction. These laws, and all such work as I refer to being done on the other side, are now available to guide road reformers in this country. But our American friends have not stopped at law-making. In their usual practical way they have gone to work and have actually made good roads. The pioneer county in building any large extent of Macadam or Telford was, I believe, Essex County in new Jersey, which, it is interesting to find, took up the question twenty-five years ago, and has spent no less than $1,700,000 on the making and maintenance of such roadways. The name of Union County in the same state has recently became famous through the fact that in a single experiment in this direction it spent $350,000 in macadamizing some of its leading highways. The result, it is universally conceded, has been to enormously promote the prosperity of the districts in which the money was spent. Reliable authorities state that the price of property there has gone up from 100 to 500 per cent. since these roads were built, and that the expenditure has been got back in profits half a dozen times. Many varied evidences are given of the vast benefits which have accrued from an expenditure which at the time seemed excessive and an imposition of heavy burdens on the people. Another district in which practical work has been done with the same good results is Richmond county, N. Y., better known as Staten Island, where $300,000 was recently spent in macadamizing. In many other parts of the United States the work of road improvement has been taken up in the same practical way and in a spirit of determination and enthusiasm which is certain to lead to beneficial and widespread results. If Canadians wish to keep pace with their neighbors in the race of progress, it is time that they set about commencing their bad roads and making good ones.

I need not describe to you the system under which we make our roads, which is known as the statute labor system. It may have done very well in the pioneer days of a colony; but it has long outlived its usefulness. It is a relic of the past, if not of semi-barbarism. It should at once be nullified. In time it must be replaced by more rational and intelligent methods and a general system capable of producing good results. The defects of the statute labor system are

that it places work requiring skill and superior intelligence under the direction of those who may possess neither, and who seldom have any special training for such duty. This is a radical defect which cannot exist in any sound system. When a farmer wants his law business properly transacted he goes to a lawyer; when he builds his barn he engages a contractor; when he breaks his arm he secures the aid of a physician; when he wants his cheese made he employs an expert to make it; when he wants his roads built—over which he must drive his family and take his produce to market—he places the work in the hands of those who know nothing of the principles of road-building, and whose selection has usually more reference to municipal politics than to their knowledge of the public duties which they are supposed to perform. A second defect of the system is that all the work of road-making and repair is usually done in about one week, and during the very worst part of the season for such work—about the end of July or the beginning of August—when, in many kinds of soil, the ground is so dry as to make grading difficult, in many places almost impossible—in all cases vastly more expensive and less effective than it would be, say, during May or the early part of June. A couple of years ago I sent out circulars to many municipal officers and representatives asking for information in reference to the statute labor system. In scarcely any case did the replies suggest that statute labor, as ordinarily performed, was worth more than fifty cents a day. My own opinion is that in the aggregate it is worth vastly less—because much of it is worse than worthless—owing to the common practice of pathmasters undoing year after year what their predecessors have done. But taking the value of such labor at fifty cents, is it not incredible folly to have it done by farmers and farmers' sons in the month of July whose time ought then to be worth $2 a day or more on the farm? The farmer who is not worth more than this on his own land in mid-summer has mistaken his calling. He has no business to be fooling his time away, often little better than pretending to do road-work, and doing it under the direction of men who, in too many cases, know no more about road-building than they do of electricity. I am quite aware that in some places very good work is done under this poor system, and that many men working under it conscientiously endeavor to do their duty. But I fear that too many of our road-makers under the statute labor system forget that they are working for themselves when they are working on the public highways; and that their sense of duty is not so strong as when they are attending to their own affairs. In a curious book which I picked up the other day on Wayfaring Life in the Middle Ages, I read that in England in these olden times road-making was regarded as a religious duty. There were even religious orders established to build roads and bridges, which they did with a marvellous skill that has left numerous monuments to this day. And in the vision of Piers Plowman, among the duties which Truth makes rich merchants perform in order to win Paradise, is the sacred, the pious duty of building and repairing roads. How far we have fallen from the ideas and the devotion of the past those of you know who have seen the work of road-making go on under the average pathmaster in rural Ontario.

In the discussion of this question I have often been asked if I would abolish this statute labor system, which I condemn as unsound in principle and inefficient in its results. My answer is that I would not abolish it until there is something better to take its place. In the meantime, I believe that vastly better work on the average can be done, even under the present perfunctory methods of a poor system. Municipalities already have the power to commute statute labor, and to expend the money collected directly. But I have never felt any desire to see advantage taken of this, because money spent on other labor under inefficient supervision will produce little better results than statute labor under the same direction. Even if advantage were taken of the present commutation clauses in

the law, there would still remain all the defects of which road reformers complain. No system will be satisfactory which does not remedy the defects to which I have alluded, and which does not provide for the work of repair to go on from early spring until late in the fall. When the farmer breaks his wagon he repairs it at once; when he destroys the roadway in early spring he leaves it until midsummer—and even then he fails to repair it. For the present system does not provide for nor secure what may be called the proper maintenance of the roadways in any sense whatever.

But it is sometimes said that road reform would impose heavy burdens on the farmers which they cannot sustain. This is not only untrue, but it is the very reverse of the truth. The object of road reformers is to remove the burdens which the farmers now bear; and they do not propose to impose any new ones. It is not easy to arrive accurately at the cost of road-making; but it is much easier to get nearer the cost of good roads than to estimate the almost incredible cost of bad ones. Many years ago a Parliamentary Committee in Great Britain reported that the improvement of the rural highways of the country would save in the use of horses, and in other kindred ways, no less than five million pounds sterling per year. The Highway Commission of Massachusetts officially report that bad roads cost the people of that commonwealth somewhere from five to ten millions annually. In a similar way a high authority computes the cost of bad roads to the State of Illinois at sixteen millions. Col. Albert A. Pope, one of the leading road reformers of the United States, declares that bad roads cost the United States 250 millions a year. For instance, here is an illustration of what good roads would do: they would save the use of two millions of draught animals, worth one hundred and seventy millions of dollars, and costing $100,000,000 a year. It is further computed that in many counties of the United States 10,000 draught animals are kept idle no less than four weeks in the year by bad roads—at a cost of $70,000 or more. Another authority computes that the fifty millions of draught animals in the United States are kept idle through bad roads long enough each year to entail a loss of $15 per head, or more than twice as much as some estimates. This may be a large estimate, but it is sufficiently reasonable by way of illustration, and sufficiently startling to excite enquiry on the subject. We have in Ontario, in round numbers, 350,000 working horses. Even if we computed the loss of time, through idleness caused by bad roads at certain seasons of the year, to be not more than $4 per head each, it is an enormous sum to pay for present methods of road-making. My own opinion is that the loss in this direction is several times this amount. And who will compute the loss in injury to horses and vehicles—apart altogether from the loss of time and of keep—that is due to the rough condition of our country roads? Every veterinary surgeon in the country, and the back yard of every farmer and of every blacksmith shop is evidence of the enormous burden which the farmers are now bearing through bad roads. In an industry in which I have taken special interest I have been making some enquiries on the subject. There are, in round numbers, about 2,000 cheese factories in Canada. The cost of drawing the milk, whey and cheese at each factory is probably $1,000 a year—perhaps a good deal more—or two millions a year for the whole country. It is quite certain that with roads anyway approaching those of England this cost could be reduced by a fourth. In other words, the profits of the cheese trade in Canada could be increased by half a million dollars each year—a very good interest on thirteen millions of an output. Such figures as I have given may not be—they cannot be—entirely accurate. Indeed they may entirely fail to give any adequate idea of the great, the almost incredible, loss which the farming and business interests of the country suffer each year through bad roads. It is to relieve the country of this intolerable burden of direct taxation and to put money into the pockets, especially of

the farmers, that the demand for good roads has become so general and so persistent. The road reformers are the true economists of the present day. Those who doubt the ability of the people of any country to pay for good roads should remember that England pays the enormous sum of twenty millions per year to maintain her rural highways. France spends eighteen millions, and the people of Italy, whose poverty keeps them on the verge of revolution—who are incomparably less able than the people of Ontario to bear such burdens—have spent sixteen millions of dollars in five years in keeping up their roads. There is no possible expenditure, present or prospective, which can be named which would at once relieve the people of this country of their burdens, and at the same time increase their profits to so great an extent as an expenditure in making good and permanent highways throughout the country, and in maintaining them properly under competent supervision. We are already paying for roads, and we are paying vastly more for bad ones than good ones would cost. Governor Flower has shown that the average cost per year of the rural roads for each county in New York State is over $50,000. This represents a sum that would build from 100 to 200 miles of Macadam in every county, provide for its maintenance and the improvement of the balance of the rural highways besides.

It is natural that in proposing a change in methods, and one that will radically affect results, some objections and opposition should be met with. No reform was ever brought about without opposition, and the more beneficial and more radical the reform the greater at times is popular opposition to it. It is said that the farmers in some parts of the American Union actually petitioned the Legislatures against giving railway charters on the ground that the steam engines would burn up their crops, and that the railways would spread disaster in many other ways throughout the country. And occasionally we find a man who approaches the question of road improvement in exactly the same spirit. The curious might speculate as to the origin of the kind of unreasoning dread which a few people have of the results of this agitation in favor of rational methods in road-making. I sometimes feel as if it arose from a sort of hereditary instinct of self-preservation. You know that the Roman roads in Great Britain, like many other of the great highways of the world in the early ages, represented the march of conquest. They were the agencies of invasion, and they stood as monuments to the invader. And there is little doubt that the feelings entertained in the old world in past times against the opening up and improvement of roads throughout the country arose from this historic fact. Some Canadians do not seem to have got the influences of heredity out of their blood at the present day.

Then I have heard it said that some of our friends of the engineering profession are actively interested in the question of good roads. I have not yet seen any evidence of this fact, but I hope it is true. The farmers have employed the engineers to enormous advantage in constructing municipal drains in various parts of the country, and which have doubled, in some cases multiplied ten fold, the value of their lands. And they could use the engineering profession with equally good advantage on the streets and highways of the country. I have observed that we educate our engineers and surveyors at enormous expense in a national institution only to see them enter the service of other countries for want of anything to do in their own land. We could retain them at home and give them employment which would offer opportunity for useful careers, and add millions annually to the profits of agriculture in this province. Some day our people may learn the simple—but at present the apparently alarming—truth that engineers might be made as useful in road-building as architects are in the construction of our public buildings.

In the discussion of this subject we are constantly asked if we would advocate the system of macadamizing roads over the whole country. Certainly not. The immediate cost would be too great to be seriously considered, and is wholly unnecessary. We hope to see certain of the leading roads in every part of the country macadamized in the near future; not only because they are the best where the traffic is heavy, but because they would serve as object lessons and prove the value of good roads in contrast to inferior ones. But in most sections of the country where gravel is procurable well made and carefully kept gravel roads are all that is required; and in the back concessions of the country where gravel is not procurable even the mud roads can be so greatly improved by proper construction and maintenance as to answer all the purposes of light traffic very well indeed. The question of what kind of roads should be built is one of locality. It depends on conditions which will vary in different sections.

It is said that the farmers are opposed to this agitation for better roads. If this were true, it would be incredible; because the chief object of the reform which we seek is to benefit agriculture and all the interests which depend directly and indirectly upon it. It is quite true that in some quarters there are signs of opposition, or at least of prejudice. This probably arises from a misconception of the objects aimed at by those who advocate better methods and an improved system. But many of the farmers of this province are among the most intelligent and the most earnest advocates of good roads. It is the same in the United States, where the ablest official representatives of the Grangers and other organizations among the farmers have been among the leading contributors to the recent literature of good roads, and the ablest champions of the movement on the platform. And now that our farmers are taking a more active interest, not only in their own affairs, but in the affairs of state, it is safe to say that they will no longer tolerate conditions which have done so much, not only to diminish their profits, but to isolate them, and to retard their social and intellectual advancement as well as their material progress. But the farmer is a cautious man, and he must be convinced both by appeals to his reason and to his pocket; and I would warn all road reformers that any methods or any system which does not appeal not only to the intelligence but to the pocket of the Canadian farmer, will fail of success, because in the end it will be the influence and the votes of the farmers which will decide this great question and determine the rate of progress which the movement in favor of road improvement will make. But anyone who has studied the question, who has come to realize the enormous losses sustained by bad roads, and the vastly enhanced profits that would accrue to agriculture through good roads, need have no fear that in the end the Canadian farmer will be found to be both an earnest and intelligent champion of reform.

As we have said, a good deal has been done in this country already to prepare the public mind for more definite action, but only a beginning has been made. If the agitation is not to end in mere declamation, it is time that it should result in organization, and such organization should have clear and well defined aims. In the first place it should seek to obtain information on the subject from every possible source, and then to distribute it in the widest possible way. It should keep up with persistency the work of education through the press and on the platform. It should interest the Department of Agriculture in the work, and secure Government aid in carrying it on. It should make elaborate enquiry as to the location of road material in every municipality of the province and the cost of its distribution in the less favored localities. It should compile and compare the laws on road-making in every part of the world, and then prepare for the representatives of the people the lines upon which the legislation of the future should proceed. One of the baneful features of legislative work of the present day is the eternal tinkering with our municipal law. We should not tinker with

the laws relating to road-making, but prepare comprehensive legislation which will express the mature judgment of those who have deeply studied the problem, based on the experience of all other countries.

In conclusion, I beg to express the opinion that no greater question to-day confronts this country than road improvement. It touches almost every interest of the nation, especially those vast natural and industrial ones on which the life and progress of the people depend. As has been said, good rural roads are at once an index and the agent of civilization. Bad roads retard social and educational progress. Good roads transform the districts through which they pass and lead to a higher civilization, especially among the rural residents of every country. They enhance the profits of agriculture, of commerce and of the manufacturer. They feed the railways, which are the great arteries of travel and of trade in modern times. They not only promote social culture by promoting intercourse among those who are the most isolated of the population, but they aid the churches and the schools by making travel easy at every season of the year. The improvement of our rural roadways and the beautifying of the roadsides will elevate the tastes of the people, increase their love of farm life and strengthen the love of home among the favored children of the farm. This movement in favor of reform thus appeals not only to self-interest but to the patriotic impulses of our people, whose desire and whose pride should be to make the streets and rural roads of Canada equal to those of any country in the world.

Mr. James: I would like to say in this connection that the Minister of Agriculture will be with you this afternoon. He has been looking forward with great eagerness to this convention, because the Department is looking for light. I suppose there is no question of greater importance at the present time than that of road reform. If you can supply us with any information on the subject that can be spread broadcast among the farmers of the country you will greatly benefit the farmers and agricultural interests in general. There are two points that I would like to mention in this regard: the first is that as a convention we ought to get right down to business. I do not think that anything need be added to your paper, which is one of the most useful I have ever listened to on the subject. It proves that good roads are not merely a good thing but an absolute necessity to this province. The question, then, is how to go about it, and if the convention can advise any way that is practical, it will have accomplished a good deal. It seems to me that the whole question turns upon the improvement of what we call the common earth or dirt roads of this country. Last year the Department published a bulletin on road-making. The criticism of that bulletin is that it dealt particularly with the higher classes of roads—Macadam. Telford, etc.—what we expect in a great many years, and that it rather over-reaches the subject. We need information regarding the common roads of the country. If we can spread information about the improvement of what we might call the universal road of this country, we shall have accomplished a great deal. We are looking for light along that line.

Mr. Monteith: This is a subject that is interesting to all of us, and is something that I came to this meeting to gather knowledge of. I wish to take information home to disseminate among my fellow workers. I give the statute labor system all due respect—it has accomplished a work in this country that I do not think any other system would have accomplished, but we require to bring it into harmony with advanced ideas. In our locality we have a good supply of gravel, which no one will dispute is the cheapest material for the making of roads. In some localities, where it is distant from the pit, we have had some of the gravel hauled in winter time, thereby giving useful and profitable employment to farmers' teams. This has been found to work well. By

having the roads properly looked after and gravelled early in the spring the best results are arrived at.

Mr. PATTULLO: At what time do you do your statute labor?

Mr. MONTEITH: In June. I think that is a matter the law deals with under the Municipal Act. Another thing under the Act is to put gravel on in winter time. This I am opposed to. To draw it almost destroys our roads for a time after it is put on, and in case an accident occurs the municipality is liable for damages. The amount of gravel to be put on, the height of grade and the results of under-draining are points I would like brought out. As a municipal officer it would be a guide to me in my own experience. One of our difficulties is to get the best gravel for the purpose. Pathmasters are too negligent about the gravel. In our district we have a certain gravel standard, and our contracts are more satisfactory than the statute labor system. We generally apply each year one and a half yards to the rod. This will give you a very good roadway for ordinary traffic. I would like to find out as to the results of under-draining—that is tile draining—the public roads. I know that draining on the farm has an influence on private roads on the farm that is very satisfactory. But the spirit of the age has not advanced sufficiently in our county to admit of this on the highway. Then there is the point as to whether tile put on each side of the road or one tile placed under the road before it is graded would give better results. Perhaps one system might prove equally satisfactory with the other on ordinary occasions.

Mr. HILL: How far have you to travel for gravel?

Mr. MONTEITH: About five miles.

Mr. HILL: How do you pay?

Mr. MONTEITH: So much a yard. We get it delivered as cheaply in winter as in summer—there is no advantage. We find that where the gravel is put on early in the season it gets worked in and becomes solidified before the fall rains come. I would like to know what machine is most satisfactory for paring off the sides of a road? In many of our older roadways the gravel sinks in the centre and silts up the sides of the road. Hitherto, we have done this work by hand. We have also discussed the question in the council as to whether the ditches should be nearer the sides of the road or nearer the fences, but have arrived at no conclusion regarding it. We all agree that an open ditch near the road will take the water from the sub-stratum, but there is a danger of accidents from such ditches.

Mr. SHEPPARD: I think the discussion would be better deferred until after we have heard the different ideas expressed. Mr. Monteith has brought forward a good many practical questions as regards road-making. There are some points that I would like information upon. The question is, ought we to go on with the discussion at the present time?

The CHAIRMAN: I think the meeting has started right at the beginning—to raise practical points and discuss them. That is what we want. We are here for something practical as well as theoretical, and perhaps it is best that the discussion should go on now.

Mr. SHEPPARD: I look on it that we are now entering on a new era with regard to road-making. Within the past few years machinery has been introduced that before was altogether unknown. We have road machines that are almost perfect for every particular kind of road work. Last year we bought an American road machine. We find there is hardly any kind of grading that it is impossible to do with it, even to digging ditches. Another machine I have seen

in operation is a stone crusher. I do not know how many places there are in the province where there is no stone, but in travelling I seldom go very many miles without seeing large quantities of stone in the fields. It is considered by many that this is a very poor material for roads but I cannot agree with this. In our township we have a piece of road that is not excelled by any in Ontario. This was made of common field stone unbroken. It was what was called the swamp road, because it ran through low ground. Now with a light dressing of lake gravel we have a hard road-bed all the year round. Along the mountain, where I live, we have any quantity of white and red sandstone. This of course requires breaking. I know a stone crusher that will crush a yard of stone in fifteen minutes that can be purchased for $600. One in the township of Grimsby has been in use for two years and has cost nothing for repairs. This improved machinery is certainly a very great advantage in road-making. As Mr. James said, the bulletin issued by the department looks towards expensive and permanent highways and it is useless to ask the ordinary municipality to furnish the money for that purpose. What we want to know is how to construct better roads at a reasonable price.

Mr. MAHON: I read with great pleasure the bulletin issued by the Department of Agriculture on "Road-Making," but I quite agree that it goes a little beyond the question. Our county of Wellington has, I think, acted in a very public-spirited manner in expending considerably over $100,000 in making county roads. These roads are a credit to the county and a great boon to those using them. It has lately been proposed to relegate the repairing of county roads back to the municipalities. The fear is justly entertained that if such were done, the roads would go out of repair.

I think our aim should be to educate the rural sections of the country and the farmers up to the necessity of doing away altogether with the nearly obsolete system of statute labor. (Hear, hear.) At the Central Farmers' Institute meeting yesterday it was proposed to make statute labor compulsory in all townships. I am not in favor of that for the reason that we have a system which leaves it optional with councils to commute the labor. But, desirable as this would be, very few councils have availed themselves of the privilege. Those who listened to the discussion yesterday must have been impressed with the fact that in the large majority of municipalities throughout the province statute labor is not performed in the manner in which the inaugurators of the system intended it should be. But there are still men who charge themselves with the duty of carrying the system out in the proper spirit.

Statute labor is a direct tax incumbent on every ratepayer of the municipality to pay either in work or in cash, and none should be permitted to escape the payment of their just share. Any system that admits of this certainly wants amending in some way. The present system not only does that, but worse; it has a demoralizing effect upon those who know it is a lax system and escape the obligations imposed upon them. It also gives people the selfish idea that they are interested in roads only in their immediate vicinity.

There is a great difference in the ability to make roads in some sections as compared with others. In some sections $10 will go farther than $100 in others.

If statute labor were commuted there would be no difficulty in creating a national sentiment as regards the maintenance of our roads so that every citizen would feel it incumbent upon him to do his full share. There are about 4,000 days of statute labor on the roads of our township and the rate is sixty cents per day. In 1892 we expended $4,720, $2,400 of which was commutation. The county rate is $3,580. Mr. Pattullo quoted one gentleman on the American side as stating that in their county they spend $50,000 on this work. If you will

multiply the sum I have stated by the number of townships in our county you will see that we come quite up to that standard.

I trust that the movement here inaugurated may have effect in awakening our farmers to the necessity of getting rid of the selfish and inefficient system of statute labor. Whatever our farmers may be in politics, they are certainly very conservative in sticking to their old practices. They are perhaps not so slow to learn as to unlearn.

Mr. BIRDSALL: There are many complaints about pathmasters not doing their work properly. The matter rests with the township councils: they should appoint properly qualified men to look after the matter.

The CHAIRMAN: I do not believe that any road reformer wants to increase our officials. We ought to start by setting that down. We do not want any officials from Toronto or anywhere else to make our roads; we want overseers. I do not care whether they are engineers or farmers. We want men to oversee the making of the roads who know how to make them and are trained to do it. If the present pathmasters are not right now, educate men who will be right. You have lots of them on all the concessions of this province. We have an agricultural college, and there are young farmers now who are able to undertake this work.

Mr. ZAVITZ: I think the first question is, what kind of roads do we want? In our township we have some well graded roads, fairly well drained and gravelled. I believe that such roads as these are meeting the requirements of nine-tenths of the farmers of this province. The statute labor system has its difficulties, but I have not seen a better plan pointed out yet; it lies mainly with the township council whether the system shall be improved or not. In some sections where there are sharp men who understand their work pretty thoroughly the roads are object lessons for the whole township. Our township council has made grants in addition to the statute labor. They have given a dollar a day for a team and driver to draw gravel. The pathmaster has also the privilege of making a bee to put on gravel where the roads are sufficiently graded, and in that way a great many of our roads have been much improved at a low cost. We insist on the maintenance and improvement of our roads, and many of us are willing to allow our teams to go on the roads at a dollar a day for the improvement they make on the roads and to our farms. So many took advantage of this arrangement that our council had to put a stop to it for a year or two because for a short time our taxes were much increased.

Mr. BUCKTON: How much did you pay the men?

Mr. ZAVITZ: Nothing. We have gravel in several parts of our township and they did not have to draw it perhaps more than three miles.

Mr. BUCKTON: In reference to the municipal councils appointing pathmasters, I have been in the council three years and I think we always endeavor to appoint the best men we can, but they are not supposed to know every man or his capabilities as a road maker. I think myself that the best thing would be to place overseers to lay out the roads and let the pathmaster follow his instructions. Another thing I would like to see would be to compel people to drive on the middle of the road.

A VOICE: Make the middle of the road the best and we will drive there.

Mr. JUDD: The government gives a grant for the planting of shade trees on the highway. I maintain that it is impossible for any one to grow shade trees on the side of a public highway because they are destroyed by the traffic. I know that the municipal councils have the privilege of setting apart a part of the road for this purpose but they do not do so. I have been striving to have our council

undertake it for two years past. If this were done trees would grow, but they will not under the present conditions. I am in the township of South Grimsby part of the time and part of the time in the city. In some localities we have good roads but in others very bad ones. Our forefathers—and we have very much respect for them—undertook to dump all the stones they could find into the centre of the road, and since then it has been our duty to try to get them out. We have been furnishing vehicles for a great many years to try to break these stones but the stones are still there. It seems to me to be folly for us to undertake to discuss how to make roads. We are here, as I understand it, to discuss first how the road system may be improved; after that, we will then invite municipalities to receive instruction as to how to build and make roads. The question of stone and gravel, the question of locality and the kinds of roads required—all these are questions for the men appointed by the municipalities to build the roads to decide. I presume none of us are going to build roads ourselves. In our county farmers are continually stealing a portion of the road. They move their fences and take a piece off each side. I think this should be prevented in some way. If we are entitled to sixty-six feet of road we ought to have it. I quite agree that we will have to get rid of the statute labor system some way or another—it will not do. Under it the work is not more than half done. Some of them do not want to do their statute labor when they are called out; they ask to be allowed to do it at a more convenient time. Then they do about two hours' work and make the return that their work is done.

Mr. McEwing: In cases of that kind it is the duty of the pathmaster to mark the work "undone," and the tax is marked against the man's farm. It is put on the roll and levied that season.

Mr. Judd: I have never known of a single instance in our county where under such circumstances the return has been made and the tax levied upon the land the same year. As regards statute labor, my idea is that I do not think it would be wise to put it in the hands of county councils—there is too much politics. If a man wants a road made in one section of the county he has to work up a petition and do a lot of preliminary work of that kind. I consider that there ought to be what I would call trunk lines of good Macadam roads throughout the country built by the government. Each line of road that runs therefrom should be built by the municipality and paid for by them. Each municipality should appoint an expert road commissioner. A commissioner with two teams and six men paid by the year by the municipality will do more good than all the statute labor.

AFTERNOON SESSION.

Mr. Pattullo: The meeting would probably do more wisely if it would do business rather than spend too much time on papers and long addresses.

Mr. Judd: I would like to make one suggestion more for the purpose of hearing a little discussion. I would suggest remittance of a portion of the taxes by the municipality to every farmer who uses a double tire wagon. This has been done in some parts of the States with very good effect; they remit the farmer $2 per annum.

Mr. Beam: I read a paper yesterday at the Central Farmers' Institute that dealt with a number of features of the road question. I dealt with the question of tires to the satisfaction of all who spoke to me after the paper was read. England has had that experience and they find it impracticable to make laws about tires. The great question appears to be how to satisfactorily change the

present system of statute labor. We come here to-day not with prepared plans, as I understand it, but to work out a plan. I do not know what plan would be most practicable and suitable to all parts of the country, but if there is an organization, it will be their business to look after the matter and investigate it, to compile statistics of the experience of other countries on the road question. There is an abundance of information to be had by which we could be guided. There is a system in operation in some of the States by which the townships are divided into sections. These sections are in charge of parties responsible for building and maintaining the roads—they are accountable. As it is, what is everybody's business is nobody's business. With regard to what was said as to the width of roads, a legal question arises: How much of the width of the road are we compelled to keep in proper shape for travel? According to some judges, the whole width of the road, and if there are bad ditches, the township is liable for accidents. The travelled portion of the road need not be wider than twenty or thirty feet—twenty-one feet is adopted in some countries. The metal or stone part, need not be more than ten or twelve feet wide. I was delighted with Mr. Pattullo's paper—it presented the subject in a different manner to what I treated it. The main point is, can we get the people earnest and anxious to have better roads. If so, the question is solved, for they will have better roads.

Mr. McDOUGALL: We have heard about the statute labor system, its weaknesses and failings. I think the administration is more to blame than the law itself, and that the people are responsible. I believe, however, that the day has come when the statute labor system can be done away with and a better system inaugurated. As people become better off, they will doubtless require better roads. The object of this meeting, I believe, is how to obtain these. We cannot well advise any system that would work equally well in all parts. The main question is, where are we to get the money to build our roads. In every municipality you will find good men who are able to lay out and construct good roads if they had the money. In our township no limit is placed on the road expenditure. When the people on any particular road feel interested and are anxious to have that road built of permanent material and will contribute half the cost, the municipality will build it. In that way the people have a direct pecuniary interest, and we find we get better value than in any other way.

Mr. McEWING: I may say that this is a subject to which I have devoted but little attention and probably my remarks will not meet your views. The first subject that calls, I think, for discussion is the impression that farmers as a body are averse to road improvement. The farmers are not averse. There is no body of men that has a greater interest in good roads than the farmers. We are willing and anxious to have good roads, and we have been trying to get them under the statute labor system. The farmers are very conservative and do not wish to change till some other system is devised. In all the discussions I have heard in regard to this subject, no such practical scheme has been suggested. I think we shall all admit that the system has outlived its usefulness. I think there is a great deal of valuable time wasted in maintaining our roads under that system. The farmers are very averse to any increase of taxation. If this meeting can evolve any scheme whereby roads can be improved without an increase of expenditure, it would accomplish a great deal. There is good reason in some localities why there should be aversion to changing from the old system. Take, for instance, farmers who are willing to do and who do perform their work faithfully. They think they are doing very well, and if some scheme were devised to spend money in portions of the township where the people had not done their duty and where the roads were in a bad condition, they would say, and rightly so, that it is an injustice. A good deal has been said about the English roads and their

good quality. We do not require roads of that kind in this country now. The requirements of trade are not such as to render costly permanent roads necessary. In nearly all the municipalities we have railroad communication, the roads leading to market are short, and further, we have four or five months in winter time when they are buried in snow. In the dry season nothing is more pleasant for travel than a good clay road. The great necessity for good roads is for a short period in spring and fall. Then our climate in this country would disarrange permanent roads to a large extent, and it is not necessary to go to a large expense of building Macadam and other roads. Circumstances have to guide us largely in the building of roads, and the material is a consideration. In some localities they have good stone and good gravel and there is no difficulty, but in other districts of the province this is not the case. There are road machines now for putting up clay roads at a cheap rate; these can be utilized in districts where they have no better material.

With regard to doing away with the statute labor system, the general difficulty is, who is going to have charge of the money, and how it is to be expended? The majority of the farmers are opposed to increasing the official staff of this country. We have too many of that class of men already to support. In a great many municipalities men are elected to the position of councillor who are entirely unfit for the management of roads. They do not study the matter as to whether the overseer understands the building of roads or not. Secondly, a great deal of money is mis-spent. After hearing some discussion on the matter, it appears to me that if municipalities would be willing to try the experiment, they now have the power to abolish the statute labor system and appoint properly qualified persons to oversee their highways. In our municipality we pay a man $200 for overseeing the road work from the commutation tax; it would not take a very large percentage to add to that sum to make a very fair salary for such a man. Municipalities would then have some systematic method of building roads. It would be the overseer's business to have the roads fairly uniform; they would have a vastly better appearance and would improve with a considerably less expenditure than under the present system. Of course that would mean another official, but he would take the place of the present commissioner. He might either be elected or appointed by the council. I believe that in road-building the first principle is to get the road-bed dry. We have conveniences for drying the road-bed; for instance in many districts there is good tile. If wet roads were properly drained under the road-bed, a good clay road, if rounded up by the road machine, could be kept in good condition nearly all the year round. Another drawback under the present system that would be done away with is that roads receive attention only at that period of the year when they do not require much attention. Very often one day's work in the spring or fall would be worth two weeks' work in the summer. Perhaps one of the most necessary things in connection with this movement is the necessity of educating the people. This work can be advanced by such an organization as is proposed here. With regard to taking government money to build trunk roads, I am decidedly opposed to anything of that kind. We have outlived the time when public money should be expended on roads in settled districts. If trunk roads are required, it is railways, not trunk wagon roads. In our county they borrowed and expended a large sum of money on roads prior to the advent of the railway and they have paid nearly all that money themselves.

The CHAIRMAN: I see Mr. Campbell and Mr. Bell here and would suggest that Mr. Campbell give us his paper.

Mr. CAMPBELL: In order to put myself right with you I would say here that I am an engineer. I have a pretty good job at the present time, however, and

am not looking for a position. In the first place I am here as a municipal officer, having something to do with roads, and having constructed a number of them within the last few years. In the second place, I represent the *Municipal World*, and I wish to gain some information on the question in the interests of the general public. I am not a farmer, but my business is closely identified with farming. The farmers need not think that engineers are anxious for the job of pathmaster, but if you want to employ our services to systematically improve your roads, as you employed us under the Drainage Act, we shall be very glad to assist you.

IMPROVEMENT OF COUNTRY ROADS.

By A. W. Campbell, City Engineer of St. Thomas.

When the country was new and the people were not in a position to pay money tax for building and repairing roads, it is quite easy to understand their reason for adopting the statute labor system, as they did the system of making bees for chopping out a piece of forest or cleaning up a fallow. But as their financial position improved, they realized the fact that it was not profitable to spend days, and possibly weeks, to repay by day's work the time put in for them by men whose services were little better than useless As time went on they became aroused to this fact, as well as to the fact that one-half the value of their time in money paid to good workmen would secure the same amount of work performed in a better manner. The statute labor system should be as readily and perfectly discarded as the old system of invited labor. It is unfair because it recompenses inferior hands the same as those who are good workers; it places all classes of workmen on the same basis; it compels each man to work on the public road for so many days. The actual cost of maintenance is greater than under any other system. Though the township pays no money to maintain these roads, their maintenance costs the taxpayers an enormous amount of labor, which represents to them so much money. The payment of taxes in labor is not profitable, in that taxpayers thereby shirk their duties to such an extent that the roads suffer from neglect and mismanagement. It allows property owners to impose on their township by substituting inferior hands, while they draw the same compensation for them as that received by able-bodied workers. Transient labor cannot be as systematically directed as can the labor under a contractor. He expects so much work from his men, and sees that they accomplish it. It often happens that a farmer finds the roads absolutely impassable for a loaded wagon just at the time when some of his products would bring the highest price. He is therefore obliged to work and accept a lower. It is of primary importance that a general conviction be created to the effect that the improvement of our highways is imperative, and that money wisely expended for this purpose is sure to return. The cause that operates more than anything else in retaining the present system is the fear on the part of the taxpayer that any reform which might be instituted will increase the taxes and thus increase their burdens. No reform will likely meet with their approval that threatens to materially increase the taxes. They must be educated to understand the value of the reform. They must be brought to see that improved roads will increase the value of real estate; that the value of farm products will be raised; that the price of commodities will be reduced; and that their social condition will be improved. We are so dependent upon the farmer that it behooves us to foster and protect his calling.

At the time of the agitation for a scheme to enable the better drainage of farm lands, and the reclamation of swamps and wastes, opposition was strongly

urged on the ground that the farmers were sufficiently intelligent to drain their lands and should be left free to do so when required, and in a manner to suit themselves. It was also contended that the scheme was only suggested for the purpose of making hives for officers, and would lead to burdensome taxation. But public-spirited men discussed the question and drew up a plan, which was in a great many ways imperfect, but as the Act was put in operation, amendments were made, and to-day it is the most important in the municipal code.

As an evidence of its usefulness I would cite the amount of money raised and expended in some of the western townships previous to the year 1893 :

Bosanquet, $33,000; Ekfrid, $50,000; Maidstone, $67,000; Rochester, $70,000; Sarnia, $75,000; Colchester, $100,000; Orford, $100,000; Dawn, $100,000; Romney, $100,000; Harwich, $110,000; Brook, $111,000; Mersea, $123,000; Dover, $150,000; Raleigh, $200,000; Gosfield, $200,000; Tilbury East, $275,000; Chatham, $290,000—making a total in these few townships of $2,154,000. These are only examples, as I am convinced that even larger amounts have been raised in other townships, but I have not been able to obtain the figures. $5,000,000 would be a fair estimate of the amount expended for this purpose. I know of lands that were purchased for fifty cents an acre and taxed six dollars for drainage, that are now selling at forty and forty-five dollars per acre. This is an evidence of how large amounts of money can be raised when it is clearly shown that the improvement will warrant the expenditure, and also the advantages of amalgamated forces systematically directed under uniform plans. Such results would not have been obtained from individual and disconcerted efforts. The same difficulties that existed previous to the adoption to the drainage law exist in the present system of making and repairing roads, and should be overcome in a similar manner, and the results will be equally beneficial.

Large drains are necessary and beneficial as common outlets, although distant from certain lands taxed for their construction and maintenance, and, likewise, good roads are not only a benefit to the section they traverse, but also serve as outlets to those sections. They benefit agricultural districts in that they improve the facilities for transporting the farm products to the markets, or lines of commerce, thus saving time and decreasing the amount of burden by each load. In this manner they have a great influence on the price of commodities. At the present time, with the very low price of grain, a few cents per bushel saved in the cost of transportation, is a very great consideration. If it costs one dollar to haul one hundred bushels of wheat one mile over a dirt road, and if by macadamizing the cost can be reduced to twenty cents, the price of wheat is raised accordingly. One mile saves eighty cents; ten miles saves eight dollars per one hundred bushels, or eight cents per bushel in the increase in the price of each bushel, not considering the larger load that can be carried. The price of wheat is thus permanently raised, and the value of farm lands is also relatively increased in finding an early market for their products. The growing of grain at the present time is not very profitable, and it behooves the farmer to raise mixed crops. In order to do this satisfactorily he must get close to the market I do not mean geographically, but relatively close. As the time needed to reach the market is lessened the farm is brought nearer. If improved roads make the journey an hour shorter the farm is brought that much nearer, and the better the class of road the shorter the distance.

Again, constant sleighing during the winter months is of utmost importance to the farmer, inasmuch as it enables him to team his wood, logs, etc., to the market. During an open winter, such as we have often experienced of late, our farmers in this respect are disabled. Mills are closed and a serious financial loss is the result. With metalled roads properly constructed and maintained, and

the use of low, broad-tired wagons, it would be almost as easy to carry on this class of business during an open winter as with sleighing. Our deplorable and almost impassable roads should warrant the consideration of this question from a financial and business stand-point and provide an immediate remedy.

When this problem is seen in its true light and the cost of improved roads carefully considered, taxpayers will not hesitate to consent to higher rates if necessary to bring about the desired improvement.

In St. Thomas all improvements are made under the frontage tax system. Previous to the adoption of this system, and for some time after, a large amount of money was expended annually in hauling gravel for filling holes, patching and plastering streets and making gutters in an endeavor to relieve them of water, and to make the streets passable during the wet season. From this large expenditure, year after year, no beneficial results were noticeable. The citizens became disgusted and decided to deal with the question from a business standpoint, and the residents of a number of the principal streets petitioned the council to devise a plan for the systematic and permanent improvement of the streets.

The first point decided upon was the width of roadway between the lines of curbing. These range from twenty-two to twenty-eight feet according to the amount of traffic; this being decided, the question of the class of material to be used was taken up, the cost being the principal consideration. In the outset of a movement of this description it is difficult to convince the people that first-class material and work is the cheapest in the end. However, with us, as no doubt with other municipalities, the streets first petitioning were anxious that the road should be good, but that the cost should be kept as low as possible. Gravel, put on in sufficient quantities was considered suitable. The levels were then taken and the grades established for an excavation the whole length of the street to such a depth that when the material was placed on the centre of the finished grade it would be beneath the surface of the adjoining lots, maintaining uniformity as far as possible. This excavation was curbed on each side with three-inch cedar curbing. Gravel to the depth of nine inches in the centre and six inches at the curbing was placed thereon. After the excavation for the road bed was made, tiles ranging from three inches to four inches in diameter were laid in the gutters and diagonally at intervals of from four to six rods from the centre of the roadway to the side drain beneath the sub-grade, with a fall, as near as could be, of three inches to the one hundred feet. These drains empty into the sewer catch-basins. This road-bed, labor, draining and material, exclusive of the curbing, costs twenty-four cents per square yard, or seventy-two cents per running foot, the roadway being twenty-seven feet wide, or $3,810.60 per mile. A width of eight feet would be sufficient for roadways in rural districts away from the immediate neighborhood of large towns. This would cost $1,126.40 per mile, provided the gravel is as convenient to the work, viz., not more than three miles distant.

This improvement on completion was very satisfactory to the residents of the street and citizens in general, and not being subjected to heavy traffic made a good serviceable road-bed. The result was that in the following year—1892—petitions were presented to the council for the improvement of six other streets; one about one and a half miles in length. On these streets heavier traffic had to be provided for, and I recommended that a more substantial foundation be made and the following principle was adopted:

The road-bed was formed as above described, the whole of the sub grade was covered with flake stone, of from three to five inches in thickness, and varying from eight inches square to two feet in greatest face measurement, from the quarries at Hagarsville on the Michigan Central Railway. This stone was laid by hand, carefully fitted together, the interstices being filled with chippings, forming a complete floor; it was then settled in its place by passing a five-ton

roller over the whole bed. Upon this bed was placed, four inches in depth, coarse creek gravel, which was thoroughly sprinkled and rolled by passing the said roller over it about six times; upon this was placed sufficient gravel to complete the grade, making a depth of road material eleven inches in the centre and seven inches at the curb line. This was again sprinkled by the use of a watering cart, and repeatedly rolled, and material added where depressions were formed by the roller, until the whole was regularly crowned and brought to the finished grade line. The cost of this stone per cord, at the quarry, was $1.25 on the cars; freighting eighty miles, $2.05; unloading, 60 cents; making a total cost at the work, $3.90 per cord.

The gravel was good creek gravel, hauled a distance of about three miles. The total cost of this road excavation and material complete was $1.10 per lineal foot (28 feet between curb lines), or $5,808 per mile; this would be about thirty-one cents per lineal foot for road-way eight feet wide, or $1,638.80 per mile. Owing to the scarcity of first-class gravel we found that it was necessary at the close of the work in 1892 to look for some other material. We waited upon the owner of the Hagarsville quarry and convinced him of the growing need of crushed stone, and guaranteed, if he put in a plant, to take from him during the season of 1893 one thousand cords of material, and as a result we have been using crushed stone for the past year. With this class of road the foundation is prepared in the manner described, but instead of using tiles for draining we make the excavation the same as for tiles, and fill them in with clean coarse crushed stone. After the road-bed is prepared the sub-grade is thoroughly rolled with a five-ton roller until compacted, then stone crushed to pass through a two and one-half inch ring is placed thereon, to the depth of four inches, sprinkled and rolled, after which it is covered with stone crushed to pass through a one and one-half inch ring, three inches in the centre and two inches at the sides, and again sprinkled and rolled, then a light coating of fine screenings, sufficient to thoroughly fill all the interstices is spread over the whole surface of the road-bed, which is sprinkled and rolled until thoroughly compacted, and when finished presents a smooth and even surface.

This stone costs us $5.50 per cord f. o. b. cars, St. Thomas, making the road-bed, excavation, material, etc., exclusive of curbing cost $1.08 per lineal foot (28 feet wide) or $5,702.40 per mile; this for eight feet wide roadway would be $1,754.58 per mile. These roads, when finished, have an elevation in the middle varying with the width of the road as follows:

Twenty-two feet, four inches; twenty-four feet, five inches; twenty-eight feet, seven inches; twenty-six feet, seven inches.

I have found that a roadway constructed of good, clean gravel, with just sufficient earthy material among it to secure perfect consolidation to the proper depth, makes a good serviceable road, and with proper attention is cheap and suitable for localities where the gravel is easily obtained. But the objection to them is the amount of attention and material required for maintenance.

Gravel that is worn by water is too clean for this purpose, and that dug from the earth contains, as a general thing, too much earth, which should be sifted out before using. In doing this we sift the gravel through two seives; one is made of wire two inches apart, so that all stones aboye that size are rejected; the other has spaces of three-quarters of an inch, and the material which passed through it is not used. The expense of this sifting is not very great, and the work will be repaid by the superior condition of the material and the diminution of labor in keeping it in order.

Country roads as a rule do not require a wide roadway. If practical economy is studied the central part of the roadway need only be macadamized for a width of eight feet; this is sufficient width for vehicles to drive on. For

roads approaching cities or large towns it is necessary to provide for constant traffic in both directions, then the macadamized portion of the roadway should be sixteen feet wide, as the axles of wagons and buggies are usually five feet eight inches in width, thus allowing a space of two feet from the farther wheel to the outside of the paved part of the roadway, sixteen feet four inches, or in round numbers sixteen feet would be the proper width to allow vehicles always to keep their own side of the road without going off the paved portion, and it will always give a play of almost two feet on each side, and nearly four feet altogether, thus leaving space enough for vehicles to avoid always going in the same track and wearing the roadway into ruts. If any further addition is to be made to the width of the macadamized portion it should be enough to allow three vehicles to pass over it abreast, sixteen feet and eight feet—twenty-four feet in all.

With reference to the probable cost of the construction of roads in rural districts in design and with material similar to those constructed under my supervision, I believe with all the improved mechanical appliances, such as ditching machines, road scrapers, graders, etc., with long stretches to work on, as compared with the expense of hand labor, extra excavation, care and exactness, which are necessary on our city streets, that the actual cost per mile for making the metalling eight feet wide, as shown by the figures which I have given you, would be a fair estimate of the cost of constructing the same class of roads in rural municipalities, with an addition for extra hauling of material and ditching. I would submit the following as a fair estimate of the average cost of constructing a mile of first-class road of the different materials, as follows:

In this estimate I consider that the side ditches should be on an average two and one-half feet deep, two feet wide across the bottom and with side slopes of one foot horizontal to one foot vertical, which would equal four and one-half cubic feet to the linear foot; this, at twelve cents per cubic yard, which is fair allowance for this class of excavation, would cost $211.20 per mile for drains on both sides of the road; this cost, I am satisfied, by the use of machines, could be reduced to $150 per mile, which would be a fair estimate in considering that in some older settled townships at least one-half of the necessary excavation is now made.

The next item to be considered in the estimate is the grading, and with the use of proper grading machines, managed by two teams of horses and two men, at a cost of $8.50 per day, allowing forty rods for a day's work, would be $68 per mile with the additional manual labor to fix the road-bed, make trenches, etc., say $125 per mile. So that in all cases the grading and draining would be the same. Where the gravel can be obtained within five miles of the work it will cost $3 per cord to team it; 50 cents per cord for the gravel, and 25 cents per cord for spreading, making the total cost of the gravel $3.75 per cord on the work. If gravel cannot be obtained within this distance I do not think its use advisable. Flake stone for foundation can be procured at the quarry at 75 cents per cord; teaming the same an average distance of five miles, $3 per cord; laying, 50 cents; making the total cost of the flake stone foundation $4.25 per cord. By using an equal amount of stone and gravel the average cost would be $4.00 per cord, and if necessary to freight it an average distance of fifty miles, $2.25 per cord should be added, making the total cost of stone $6.50; or the average cost of stone and gravel $5.12½ per cord. Crushed stone at the quarry costs $3 a cord, total cost $6, when procured within an average haul of five miles of the work. If necessary to freight it fifty miles $1.75 extra—making $6.20 a cord. Two teams and two men taking the work in long stretches would thoroughly roll one mile of road in a day; this should be placed at $10 per mile, and would make the estimates for the different roads as follows:

Gravel roads (material obtained within five miles):

Draining	$ 211 50
Grading	125 00
250 cords of gravel, at $3.75 per cord	937 50
Rolling	10 00
Commission expenses, etc.	50 00
Per mile	$1,334 00

Gravel road, with flake stone foundation (material obtained within five miles):

Draining	$ 211 20
Grading	125 00
250 cords of gravel and stone at $4	1,000 00
Rolling	10 00
Commission expenses, etc.	50 00
Per mile	$1,396 20

The freighting of stone, where necessary, would add to this $281.25, making the cost $1,677.45 per mile.

Broken stone (material within five miles of the work):

Draining	$ 211 20
Grading	125 00
200 cords of stone at $6	1,200 00
Rolling	10 00
Commission expenses, etc.	50 00
Per mile	$1,596 20

(Extra for freighting fifty miles, $350; total $1,946.20 per mile.)

So that a crushed stone road, the one which I would recommend for general use, would cost from $1,520.90 say $1,600 to $1,946.20—say $2,000 per mile, according to the length of the haul. We would be safe in estimating the average cost per mile of first-class road at $1,800; this being at the present prices, with the limited demand, which could be considerably reduced by increasing the demand.

Having constructed the three different kinds of roads I have naturally interested myself in trying to determine which is the most satisfactory, all things being considered, and I have no hesitation in saying that there is nothing like a first-class quality of crushed stone with a view to durability, permanence and economy in construction and maintenance.

I find that a very important point for consideration is drainage. The road-bed should be perfectly drained. If this is neglected it will certainly cause heavy annual expense in maintenance. A road-bed cannot be rendered satisfactory unless great care is taken, not only with the drainage of the road surface, and the formation of proper gutters of the streets, and side ditches if on highways in rural municipalities, but also the drainage of the road-bed and adjoining lands, and where the road is to be constructed on a wet and rententive soil a perfect system of underdraining must be provided by cutting trenches diagonally across the road-bed and discharging into the side ditches. These trenches should be

from eighteen inches to two feet deep, and about one foot wide across the bottom, with a slight side slope outward. In these should be constructed porous drains, composed of clean, coarse, broked stone or brickbats. Flint stones, or some other suitable material, if at hand, may be used, the trenches being filled up to the level of the sub-grade. They should be placed much closer than in loose soil. They should have a good fall and free outlets. I constructed one short street with flake stone foundation and gravel covering, and being anxious to keep the cost as low as possible I thought it unnecessary to go to the expense of draining the foundation, and have since taken great interest in this piece of road, and it certainly is a valuable lesson. When all the other streets are hard and dry this is wet and spongy, while during construction it was so dry that it would be apparently a waste of money to drain it. But during the wet season the wheels rut readily, while there is scarcely an impression made on those that are drained. We have already expended more labor and money on this road, which has now been travelled two years, than it would cost to have completely drained the foundation in the beginning. This one example has shown me more clearly than I thought it was possible the great importance of perfect drainage of a road-bed.

In constructing roads in rural districts, open ditches should be cut on each side of the road-bed continuously at a distance of about twelve feet from the sides of the metalling. They should be of a size and declivity to readily conduct all water that will flow on the road, or reach it from adjoining lands. They should be of sufficient depth to provide for the drainage of the foundation, at least eighteen inches above the sub-grade. The strips of ground between the road and the open ditch should be properly graded to conform with the crown and grade of the metalling, and should be seeded, and as much as possible kept in sod, and thoroughly underdrained, so as to immediately carry the water away after a rainfall to the side ditches, so they will be hard and dry; this sod will serve on a country road the same purpose as a curb on city streets. It will always be clean, pleasing to the eye, and very largely assists in the preventing the carrying of mud on the road metalling. Besides this, uniformity in the crown will always permit of teams passing each other.

To illustrate how the above figures would apply to township municipalities, I have prepared an estimate of the cost of improving 175 miles, being the road mileage at present maintained in the township of Yarmouth, adjoining the city of St. Thomas.

175 miles, cost $1,800 per mile	$315,000 00	
Equal annual payments, 4 per cent., thirty years		18,216 45
Maintenance $20 per mile		3,500 00
Total yearly payment		$21,716 45
Present maintenance, including statute labor at $1 per day	$ 9,000 00	
30 years actual extra rate		12,716 45
		$21,716 45

Total acreage in township, 70,000.
Assessed value, $2,700,000; per 100 acres, $3,850
Estimated actual value, $4,000,000.
Extra rate required for annual payment, 4¼ mills
Estimated increase in value of property, 10 per cent., $400,000.

In constructing 175 miles of stone road 50 per cent. or $157,500 would be expended for labor that could be performed by the ratepayers; this would be equal to $225 per each 100 acres.

The roads would cost $315,000, of which $157,500 would be spent in the township. The property would be increased in value $400,000. Taking these figures into consideration the township would be benefited to the extent of $242,500 over and above the cost of construction of the roads.

The great volume of internal trade is the common road trade. It exceeds largely the entire carrying trade of the railroads; for in addition to the fact that the great volume of freight carried by the railroads it is in the first instance carted in one form or another over the common highways. Enormous quantities of produce of all kinds are wheeled under the requirements of local trade in rural sections. The vast quantities of produce consumed in the local market have no connection whatever with railway traffic. So it becomes important to inquire in what manner this great carrying trade, which is constantly going on over the common roads, and which supplies not only the immense freighting bnsiness of the railroads, but the more important intercommunication between neighbors in the local market, can be best carried on with the least cost. Upon this question of economy the railroad corporations of the country have established a valuable precedent. Each of these corporations is in the business to make money. Their one object is to give little and get much, and yet in spite of the gradual reduced rates charged by the trunk lines, they have steadily increased in prosperity till the enormous wealth of these companies have become the wonder of the century. They began business in a crude, undeveloped, and in some cases, unsystematic way. Their desire to gain sharpened their wits. They experimented and found that the greatest saving in expense in the management of their railroads was to be attained by the adoption of easy grades, and by adding to the smoothness and hardness of the road-bed. These two qualities are the essentials of a good wagon road. You cannot have and keep such roads without good laws and intelligent supervision. A good road is made to last for all time, and is kept in repair at half the cost and labor expended on the average dirt road. It is looked after with the same system and care that are bestowed in the management of other departments of government. By the improvement of these common roads every branch of our agricultural and manufacturing industries would be materially benefited, and by these and other retrenchments millions of dollars would be annually saved to the public.

Every person acquainted with drainage improvement must have noticed the one invariable feature called its contagiousness; this will also be true of road improvement. Build a piece of good stone road as a sample, and the opposition to road improvement is certain to quiet down, and in a very short time the loudest mouthed opponents of taxation will be found among the radical advocates of macadamizing. The farmer with a heavy load requires once to experience driving off a macadam road into a quagmire to make his conversion complete on the subject.

The CHAIRMAN: In discussing this question, we want to know what has been done, what can be done, and exactly what it will cost. Every town and village can do what has been done in the city of St. Thomas. If you do not want such roads all over the township, Mr. Campbell shows what can be done on the leading roads.

Mr. BEAM: How were the funds raised for this road improvement?

Mr. CAMPBELL: The work is all done under the local improvement plan. It is taxed upon the property fronting on the street, and we raise the money on debentures extending over twenty years.

Mr. BEAM: Do the townships pay the whole?

Mr. CAMPBELL: Yes; and build roads at a rate of ten or fifteen miles a year

Mr. BEAM: Don't you think it would be fair to charge a frontage tax?

Mr. CAMPBELL: It would amount to the same thing; but you would have to allow a flankage on corner lots, which would be difficult. Probably the side roads would run along the side of the farm, and that farm would then pay two frontages.

Mr. BEAM: You have not taken into consideration the rise in value of the property that fronts two roads—that would have to be considered.

Mr. CAMPBELL: Not if roads were constructed on a uniform plan all over the township.

Mr. CLARK: I see you advocate the excavation of the roadway. Could not the road be built on the present roadway after properly grading it?

Mr. CAMPBELL: Where I use the term excavate, I mean where it is necessary to excavate in order to get a uniform grade. It does not matter whether you excavate or build up so long as you have it uniform.

Mr. BEAM: What are your views with regard to a clay soil district where it is difficult to obtain stone?

Mr. CAMPBELL: I provide in my paper for a haul of fifty miles by railway.

Mr. BEAM: Would you haul in the winter time?

Mr. CAMPBELL: My estimate is for hauling in summer, but a great deal of expense would be saved by hauling in winter. This would be governed by local circumstances.

The CHAIRMAN: What do you consider the value of field stone for road work?

Mr. CAMPBELL: I think it is a good material if you can get it in sufficient quantities to warrant the purchase of a crusher.

The CHAIRMAN: Where there is a great deal of this material would it not reduce the cost?

Mr. CAMPBELL: Yes, materially; you would save the cost of hauling, and the stone would practically cost you nothing. You could construct a mile of such roadway for a thousand dollars.

The CHAIRMAN: What does a crusher cost?

Mr. CAMPBELL: From six hundred to thousand dollars.

Mr. JUDD: Would you recommend the building of stone roads where there is gravel?

Mr. CAMPBELL: Not if you can get the gravel within a distance of five miles. If the gravel is not very convenient, I believe that crushed stone is the cheapest in the long run, because of the cost of maintenance. It is impossible to get gravel that will not rut. As soon as it begins to rut you have to put on a section man; that's where the maintenance comes in.

Mr. SHEPPARD: I have charge of six and a half miles of county road. I can get stone at $1.25 a yard, and lake Ontario gravel at the same price. Which would you consider the best material?

Mr. CAMPBELL: I would not have the gravel at all—it will not consolidate if it is water-worn.

Mr. SHEPPARD: We find that altogether different in actual practice.

Mr. CAMPBELL: It may be that it is not water-worn; our lake gravel is water-worn—that is, every stone is perfectly smooth.

Mr. SHEPPARD: We try to get fine gravel—small stuff from the size of a pea to a pigeon's egg, and you do not want to be too particular that there is no sand in it. We find it excellent.

Mr. MAHON: The cost Mr. Campbell suggests may be reasonable enough, but if you take the farmer right out of the statute labor system and ask them to construct such roads you would scare them. The question has been asked what system might profitably be substituted for the present one. It strikes me that it should be done in this way. For instance, take the township to which I have already referred. We have something like four thousand days' labor at 60 cents a day—$2,400; taxes $2,700, making about $4,700. That amount would be sufficient to employ four gangs of men, a foreman and three or four men, two teams and such appliances and implements as would be necessary for the greater part of the summer, commencing in May sometime, when the condition of the roads would be suitable and working till fall. There might be an addition to that in the spring and fall and perhaps winter. These gangs could work under a regular laid down system supervised by the council. Or, if the council did not consider themselves properly qualified to superintend it, they might appoint a proper official. I think that some such system as this would be satisfactory.

Several papers were then presented to be printed with the report. They will be found immediately following the record of the proceedings.

HON. JOHN DRYDEN was then called upon for a speech, and responded as follows: I desire to say to you, Mr. Chairman and gentlemen, that I did not come here to take any part in the proceedings. I did not come to tell you what my opinions are or to suggest ways out of the difficulties that I suppose you see before you. I came to express my sympathy with the good work you have in view. I realize the importance of it; I realize the necessity for action and also the difficulties that stand in the way. I am looking for light as far as I am personally concerned—light and information that I may use to guide me in connection with the work of my Department. I wish I could have been here from the commencement of the meeting, but I shall be able to read the report when it is prepared. If it contains information that can be profitably used in the interests of our country and the toiling masses of our people, I shall be very glad to utilize it in the best way possible.

Mr. BELL: I came here as a representative of the county of Elgin. I do not come prepared with any paper on the subject of road-making. I do not think it advisable for engineers to take an active part in the business that takes place; they are very apt to be blamed for selfish motives. I am interested in road improvement as a farmer as well as an engineer, and would like to see some means of improving our roads. I know the state of the roads in the western part of the province very well; I think there should be some means of improving them. I was very pleased with the able paper of Mr. Campbell; it shows you what a good road will cost. I had the honor to prepare a bulletin on the subject under instructions from the Hon. Mr. Dryden. It is claimed that the roads there described are beyond the means of the people, but I think you will draw the conclusion from Mr. Campbell's paper that good roads are cheapest in the end. Also that a Macadam road is the cheapest in the end where you cannot get good gravel convenient; and a Macadam road is not very expensive after all. I want to state that in Puslinch they expend annually something like $5,000 in statute labor. According to Mr. Campbell's calculation, 175 miles of Macadam road would cost $30C,000, and on that basis you could build something like forty-five miles of road and keep it in repair and not pay any more taxes than at present. If you look at it in the light of increased value to property, you would find it a very good investment. My experience in road-making goes to show that the better road you make from the foundation up the better results you get, and that it more than pays for the extra expenditure. As has been stated there are

large quantities of field boulders throughout the country. These are the very best material for Macadam roads, while they are practically useless for anything else. A great deal of the gravel from pits contains many large stones which cannot be utilized unless you build a Telford road, placing the large stones in the bottom, decreasing the size towards the top. The Macadam road is composed of broken stone from the bottom up. For heavy travel I consider the Telford the best.

It was moved by Mr. McEwing, seconded by Mr. Jas. Allen, and carried, that an association be formed to be called the Ontario Good Roads Association.

The constitution was then adopted.

The election of officers was then proceeded with. The list appears on page 4.

VOTE OF THANKS.

Moved by James Sheppard, seconded by J. F. Beam: "That the thanks of this meeting are due and are hereby tendered to the members of the Canadian Institute for the interest they have taken in the matter of road reform, and particularly to their able secretary, Alan Macdougall, C.E., whose untiring energy has done so much to make this meeting a success." Carried.

Mr. Sheppard: I think we might call upon the Minister of Agriculture to give the Association some financial aid to carry on the work.

The President: I should be very glad if the Minister in his wisdom could see his way to give us a small grant to aid the work of the Association, but whether we get a grant or not there is sufficient enthusiasm among us to carry on the work.

Mr. Beattie: I would like the Association to support itself and not give the Government the idea we are a lot of paupers. Let us see what we can do first, and then if the Government sees fit to assist us well and good.

Hon. Mr. Dryden: I think Mr. Beattie is correct when he says that the Government helps those who help themselves. The first thing is to see that there is something to help. The Government you have had for a number of years has always manifested an interest in matters of this kind, and I have no doubt they will continue to do so in the future.

Mr. A. Macdougall: I beg to move a hearty vote of thanks to the Minister of Agriculture, Hon. Mr. Dryden, for his presence this afternoon and for the interest he takes in the meeting. Seconded by Mr. Mahon, and carried.

Hon. Mr Dryden thanked the Association in a few appropriate words for their kind appreciation.

The meeting then adjourned.

THE MANAGEMENT, CONSTRUCTION AND IMPROVEMENT OF COMMON ROADS.

By P. K. Hyndman, C.E., Sarnia.

This problem or question may be considered under three heads, viz:—1st, Provision of cost; 2nd, Agency or administration; 3rd, Description and method of work.

Provision of Cost.

As the advantages to be obtained by good roads throughout the country are universally acknowledged, it will be unnecessary to enumerate them.

1. It is obvious that it will be premature to consider or discuss how to improve our roads before determining upon the method of providing the requisite funds for the work. As the community generally participate in the benefits resulting from the existence of good roads, if it wishes to have them, it must be prepared to pay for them in some one way or another.

2. There are two ways by which funds can be provided, viz:—tolls and taxation. They are both in vogue at present; the former where certain main roads have been "metalled," and are kept in repair by road companies, and the latter as "statute labor," on all other roads, metalled and unmetalled, throughout the country.

3. Both these systems are objectionable. Tolls, though designed to make those who use the roads pay for them, are now, by universal opinion, as well in this country as in Great Britain, conceded to be antiquated, and a relic of barbarism, unsuited to the high and enlightened civilization and requirements of the present day, and are, except, perhaps, in certain special localities, and as a temporary measure, voted a nuisance; and wherever it can be done, they are being abolished.

4. "Statute labor" is a direct poll tax, which, as its name implies, can be paid in work, as is generally done, otherwise by an equivalent money payment. The opportunity given to farmers and others to do work instead of having to pay cash is considered an advantage; but, as is actually the case, the system is a bad one. For, by it, the roads are not only not properly made or repaired, but are absolutely being rapidly destroyed. To prove this, it will suffice to point out a few objectionable features of the system. First, the want of techinical knowledge as to road-making on the part of the "pathmasters," the absence of a uniform style of work or of a specification to secure it, and the liberty given those who come on the roads to do the work, to do it each in his own way, and to waste much of their time in doing so, or in actual idleness. Second, the method in vogue of throwing down the "gravel" in a heap in the centre of the road, to be "spread" by the horses' feet (but which is only scattered by them unevenly), the lazy and pernicious way adopted of stripping the outer edges of the roadway of earth in order to "bank up" the central width of "gravel," and the neglect of timely repairs to a greater or less extent, and the doing of them at a wrong time of the year, when the roads are in a soft state, entailing extra expense in hauling in the "gravel," and cutting up the road surface, and thereby injuring it more than it would be benefited by the fresh material, which, moreover, generally disappears in the "sea of mud," leaving the road a quagmire, and worse than ever. Third, the existence of wide, gaping, open side-ditches leading to the nearest culvert, at a declivity which tears away the bottom, thereby undermining the

slopes, and dangerously encroaching on the width of the roadway; the absence of "wings" to the culverts, to "retain" the side slopes of the embanked approaches, of protection to the traffic by parapet walls and railings at their ends, and of fences along high embankments approaching large bridges, and the neglect to clear out the smaller culverts and cross-drains, which get choked up with accumulated "silt and debris" and endangers floods and tearing away of the road. Moreover, the cross-drains are generally allowed to become rotten, and are the cause of many serious accidents.

5. The two systems of tolls and statute labor tax as a means of providing funds for the purpose in view being, respectively, antiquated and unscientific, it remains to devise some other method of taxation, the incidence of which will, as far as possible, fall upon those who either use the roads to travel upon for business or pleasure, or who desire advantages, direct or indirect, from improved methods of communication such as properly constructed and repaired roads or highways must supply. The only practicable method is to have a special road tax. This tax should be levied under powers granted by a special Act of the Local Legislature, by county and township municipalities, which are proposed, in this paper, to constitute the agencies for carrying out the work. The funds being thus raised within the respective municipalities, the work will be let out under contract (to the extent allowed by the funds available), by the councils and, in this way, the money will be spent within the same boundaries in which it has been collected.

6. Though the roads will be entirely outside cities, towns and incorporated villages, it is proposed here that the inhabitants thereof should be required to contribute their *quota* towards the road fund. The provincial government also might be called upon for a "grant-in-aid" for general or special purposes, to be paid out of the provincial revenues. There would be thus three sources from which funds could be raised, viz:—1st, rural; 2nd, urban; 3rd, provincial.

The rural taxes would be as follows:

A. Farm lands. *(a)* On assessed value of lands and buildings, at a rate per cent. *(b)* On extent of arable, grazing or wood lands, at a rate per acre. *(c)* On extent of road frontage, at a rate per lineal unit.

B. Vehicles and horses. *(a)* On each farm and other heavy wagon or cart of four and two wheels, including the draught horses for the same, as required for hauling loads. *(b)* On each light spring or market wagon or cart, drawn by either one or two horses. *(c)* On each light carriage, four or two wheeled, with one or two horses. All sleighs or cutters to be counted in free. *(d)* On each saddle horse or pony kept solely for riding. *(e)* On each stallion, bull, ram and boar kept for service. *(f)* Drover's license or tax for driving cattle to market or railway station.

C. Buildings at roadside or in hamlets. *(a)* Taverns, hotels and livery stables. *(b)* General stores. *(c)* Workshops, factories and distilleries. *(d)* Grist, saw, woollen or other mills. *(e)* Salt and oil wells. *(f)* Brick fields, lime kilns, quarries and mines of all kinds. All on their assessed value, at a rate per cent or by an addition to the yearly license.

2nd, Urban.

A. Tradespeople's and other vehicles. *(a)* Travelling peddlers, each. *(b)* Butchers, or others who do their own carrying, from the country. *(c)* Insurance agents and bill collectors.

B. Pleasure carriages and saddle horses.

C. Bicycles and tricycles.

3rd, Provincial Grant-in-aid.

A. For colonization roads.

B. For large bridges.

C. For supplementary general purposes.

7. The foregoing is but an approximate list, which may be modified, abridged or amplified as may be found expedient. The object in view being, as already stated, to make the incidence as general and equable as possible. In this way the tax will not be unduly heavy on any one class, and no more need be levied than may be required, or than can be expended within the year. It being a fixed principle that the funds for roads will only be spent on them and for them.

AGENCY OR ADMINISTRATION.

Notwithstanding that it is obviously premature to go further in this subject of the improvement, etc., of roads at present for the purpose of this paper, and to make more intelligible the proposals contained in the foregoing paragraphs, it is desirable to go over, in a general outline, only, the whole question.

8. The construction of the great trunk railway lines, with their branches and feeders, brings down common roads from the category of great thoroughfares, and reduces them to the class of local means of communication. For this reason, and because at present nearly all roads are under the county and township municipalities which look after their own local affairs, agreeably and conformably to the democratic system of government so firmly established, and so smoothly and efficiently carried out throughout the Dominion, it is clearly preferable that these rural bodies should carry out the work. On this it is unnecessary to say more at present.

9. Roads, both "metalled" and "unmetalled" should be classed as (*a*) county roads, and (*b*) township roads. The former (*a*) to comprise 1st "town lines" (between townships), and county lines, and 2nd, main roads passing through several counties or townships, not being "boundaries." The latter (*b*) to comprise all other roads throughout the township.

10. An engineer to be appointed for each county, with assistants under him and to have charge of both the county and township roads. All the work intended to be done to be clearly set forth in an estimate of cost and specification, to be submitted to the respective councils for sanction. This being accorded, the work to be proceeded with, as far as possible, contract or job work, at fixed rates, quantities to be increased or reduced, if required, more or less to prevent claims for "extras." Preference to be given to local farmers and others to utilize their spare time and horses and wagons on those portions of the road contiguous to their homes. Payments to be made on the certificate of the engineer only. Accounts to be kept on a monthly separate system, and properly compiled for examination and audit. The work to be carefully and thoroughly supervised by the engineer and his assistants, and carried out in strict conformity with the specification; and for this the engineer to be held responsible. Measurements of work done to be made by the engineer or his assistants monthly or oftener, upon which the certificates for payment will be based. All disputes to be settled, as far as possible, on the spot, or, as soon after as may be practicable.

Method of Work.

11. All road "allowances," with some few exceptions, have a width of sixty-six feet. It is proposed here to divide this space up in the following way:

(*a*) Central "carriageway," say twenty-six feet wide, with, in the case of "metalled" roads, a central strip of metal twelve feet wide.

(*b*) Two strips on each side immediately adjacent to the carriageway for a single or double line of shade and wind shelter trees on each, say ten feet wide each.

(*c*) The outer strips of remaining widths of ten feet each to be utilized as footways for pedestrians.

Except in a few places, extra space for slopes of cuttings and embankments will not be needed, as the country is not hilly or mountainous and the "profiles" of the road will conform very closely to the general surface of the land. There should be no open drains beyond shallow "gutters." Covered drains filled with large or small stones for the water to percolate through being preferable. The surface of the carriageway to be moderately rounded in all cases, and repairs carried out when and where needed. "A stitch in time saves nine."

12. The requisites for a good "metalled" road are a firm and unyielding foundation, a "tough" rock material, broken to a uniform size, or clean gravel of a uniform mixture of sand and stone, carefully laid down, and thoroughly consolidated before traffic is allowed over the road. There is no doubt that, besides the difficulty and expense of obtaining good material, the upheaval of the road surface on the occurrence of a thaw has much to do with the bad condition of the country roads at certain seasons of the year. But, by good construction, firm and hard foundation, and proper and thorough drainage, frost will not penetrate so deeply, and thus "upheavals" will be less or slight. Before finishing this part of the subject, it may be observed that the principles of good road construction are plain and simple and are clearly set forth in numerous valuable treatises by eminent practical engineers.

Road-making.

By Judge Woods, Chatham.

It would be like carrying coals to Newcastle, and over bad roads at that, to say to you that good roads are most desirable in every township. These have in all ages been considered the surest evidence of the progress and civilization of a people. A recent writer says: "The condition of the roads is the measure by which the character of a people is to be measured, and he would as soon wear rags as have a wretched road pass his house." The effect of road-making in England and Scotland may be found in a report of the Committee of the House of Commons. It says: "By the improvement of our roads every branch of our agricultural, commercial and manufacturing industry would be materially benefited, every article brought to market would be diminished in price; and the number of horses would be so much reduced, that by these and other retrenchments, the expense of £5,000,000 sterling, would be *annually* saved to the public. The expense of repairing roads and the wear and tear of carriages and horses would be essentially diminished, and thousands of acres, the produce of which is now wasted in feeding unnecessary horses would be devoted to the production of *food* for *man*. In short, the public and private advantages which would result from effecting that great object, the improvement of our highways and turnpike

roads, are incalculable." The construction of the later roads in England and Scotland under Telford, produced a change in the state of the people, which, it is said, is probably unparalleled in the history of any country for the same space of time. Large crops of wheat now cover former wastes; farms, houses and herds of cattle are now seen, where was previously a desert; estates have been increased seven fold in value, and annual returns and the country has been advanced at least 100 years. Do we not know that lands in Raleigh, that were offered by the government and refused at 50 cents per acre, are worth to-day from $50 to $80, owing to *drainage*. If you had good gravel roads, they would be worth $100 an acre. Then the *moral* results of such improvements are equally great; a direct moral influence is exerted on every one on a good road. If a profane man, he isn't made to curse and swear the entire drive, and if a righteous man, he thanks God for the good road. Then the effect upon the hundreds, nay thousands, of children going to school—the even greater number of those who attend church, and your devoted ministers who have to make their way through our fearful roads to their appointed places of worship.

Roads are to a country what the veins and arteries are to the human body. Through them are carried the agricultural productions and the commercial supplies, which are the life-blood of the municipality. Good roads give rapidity, safety and economy in travel and transportation. Time is money. The more you can carry, and the faster you go, the greater the gain. Take a centre, such as is Chatham, the county town. Draw a succession of circles around it. The first at a distance, say of 5 miles; second, 10; third, 15; fourth, 20. If you improve the roads in any way, so as in any degree to lessen the expense of carriage, the radius of each circle is correspondingly increased and the area of each is enlarged as the *square* of this ratio of increase. Thus, if the improvement enables a horse to draw twice as much, or travel twice as fast as he did before, each of the limiting circles is expanded outward to *twice* its former radius, and embraces four times its former area. If the rate of improvement be three-fold, the increase of area is nine-fold, and so on.

All the produce, industry and wealth which by these improvements find for the first time a market, are, as it were, a new creation. Supposing by these improvements, the average speed over a whole county be only *doubled*, the whole population would have advanced, *en masse*, and brought themselves twice as near to the markets and other advantages of the county town, and twice as near to each other. If the speed were again doubled, the process would be repeated, until, as it were, the whole surface of the county would be so contracted and condensed. And yet every man's farm would be found, not only where it always was, but as large as ever it was and far larger, estimating its size by the increased profits of its productions; and, I might just here remark, that the possibilities of agriculture are almost beyond computation. In a recent publication by a distinguished author—Prince Krapotkin in the *19th Century* for June—it is stated that if we want to know what can be grown on a given amount of soil, we must go to the market-gardening culture of Paris, Amiens and other large cities, and in Holland, and there learn that each 100 acres, under proper culture, yields food not for 40 human beings, as they do on the best English farms, but for 200 and 300 persons; not for 60 milch cows, as in the Island of Jersey, but for 200 cows and more if necessary. What the railways are between the provinces and counties, the good road is between the townships and neighborhoods. We cannot use our horses and wagons on the railway, but on a good Macadam road a horse can draw three times as much as on a gravel road, and on a gravel three times more than on the ordinary earth road. This reduces cost of transportation to one-third of what it was before, so that two-thirds are saved, and two out of every three of all horses formerly used dispensed

with, so that the other two may be sold. If wheat is worth $1 per bushel, and it it costs 25 cents to haul it to that point from this, it will then necessarily bring only 75 cents. If good roads reduce the carriage to 10 cents, the 15 cents on each bushel is so much absolute gain to the community, and, if no toll, this would be all profit.

The President of the Michigan Engineering Co. has said, that he believed bad roads cost the producers of Michigan annually an amount equal to the entire wheat crop of the state. In this time of high prices for labor, farmers cannot afford to pay 40 days' labor of man and team to haul their produce to market, when, but for bad roads, they could do it more easily in 15 days.

And, now I propose to say a few words on providing good roads for this county, and indeed for Ontario:

This will present itself under three heads: (1) The doing away with the present system of statute labor, and substituting for it the contract system, with a road superintendent. (2) The borrowing of, say $500,000 by the county council, and making good roads throughout the county at once. (3) The voluntary system, by which this is to be brought about without the straight loan by the county.

Trade and travel are not now what they were when the roads were laid out, and the statute labor first adopted. Now we have the railways with all the wonderful changes that they have brought. *Then* the people of one county seldom passed through the other. *Now* the products of the Atlantic go to the Pacific, and those of the Pacific to the Atlantic, and so with population, and these over our railways and earth roads. It is as reasonable to expect the traveller you meet here at the station to be from Vancouver, or San Francisco, or New York, or Montreal, as from Essex or Lambton, and that trade and travel represent millions when it used to do hundreds when statute labor was started, and as it stands to-day.

The present mode of repairing the roads is a total waste of time. Your day's work must be given: this is worth $1. There are those who have as high as 22 days to put in; this is $22. Not half a day's real honest work is as a rule put in, and often not one-fourth of a day. It would be better to commute at 50 cents per day or even 25 cents and have the contract system with the improved road machinery of grader and scraper and a township overseer, who understood his work. There's a young fellow in Blenheim by the name of————, who would pay for himself ten times over by having him as an overseer and using the new machines. Making roads in this way will accomplish at least four times as much work as the present method with plow and scraper, and the work will be infinitely better for the same expenditure of labor.

Here are some figures that I have put together and you can judge of the result:

Let us take the case of the statute labor account of John Smith, a ratepayer on a 200 acre farm, based on an assessment of 22 days, as may be found in one of the adjoining townships to this town, applied as at present on the ordinary earth road for 50 years, as against the borrowing of say $90,000, wherewith to make 45 miles of gravel road the first year, on the assessment of $1,000 for a 200 acre farm:

John Smith.	Dr.	
To 22 days' work for 50 years	$ 1,100	
50 years' interest at 6 per cent	1,683	$ 2,783
Say there are 100 ratepayers, and they are, like John Smith, giving 22 days each, and you have at the end of 50 years, with only the ordinary earth road		278,300

Cost of 45 miles of gravelled roads made in 1889 by borrowing	90,000	
Interest at 6 per cent. for 50 years	135,000	225,000
Balance in favor of gravel road		$53,300
But if the assessment be low it may get as high as 30 days as it has done.		
Let us put it in another way: Statute labor as above		$278,300
Proportionate annual instalment on debentures for 90,000 upon the 100 owners of 200 acre farms at the rate of $1,000 at 6 per cent., $12.63, to give good gravelled roads in 1889, each $634.00		$63,400
Balance in favor of debenture and instalment		$214,900

with the use of a good gravelled road in 1889.

The London *Free Press* says of these figures: "Judge Woods places the matter of bettering our roads in a clear intelligent light, on purely mathematical and financial principles."

But until the *law is changed* with respect to statute labor, we must provide a system that will supply that of the old *toll* roads, whose days are numbered, and give us good *free* roads. This may be done under the second head, viz., by borrowing, say $500,000. The interest on this at five per cent. would be $25,000. The assessed value of property in the county is $25,000,000. A rate of only one mill on the dollar would be necessary to raise this sum, which would be an average of only $1 on each 100-acre farm, valued at $1,000, and this I learn is the average assessed value of farms in the county—as the value of the farm would be higher or lower so would be the rate, which might go from 50 cents per farm to $5 or $10. At $2,000 a mile this would give us 250 miles of road at once, taking in almost every road in the county. Money can be got at 4 per cent., and the *Globe* thinks the Toronto debentures should be sold at 3 per cent. It would take by equal payments $27,400 annually to *pay off the principal and interest* in 50 years at 5 per cent. What a prospect for Kent, 250 miles of good gravelled road at an average of $1 a year to pay for them out and out, and even this low rate liable to be reduced by the increase in population. Why should not the council take this step at once and make Kent the finest county in the Dominion? We have no county debt and this would not only be an honor but an incalculable benefit to us.

Then there is the third proposition, which, failing the borrowing by the county would be mine, and which might well be called the *back woods* scheme instead of the Wood's scheme, as every section of the county could be provided with a road. On submitting it to the *Globe* in October last year it did me the honor to pronounce it a "bold proposition for road improvement," and to "commend it to the careful consideration of the farmers of Ontario," and gave four or five leading editorials upon it saying that as a permissive Act it ought to pass.

This is simply the *drainage* scheme applied to roads—the principle of the *frontage* tax in cities and towns—with 50 years to pay in. Its chief points are, (1) It is purely voluntary; (2) A simple majority of those interested; (3) The absence of any voting or other cumbrous or expensive procedure; (4) The ease with which it can be put into operation; (5) The small annual charge; (6) The various contributors towards it, outside of those petitioning.

Since the discussion of this question commenced, two or three very important discoveries have been made:

1. That gravel put on top of our road does not sink into the clay and become lost as so many people thought would be the case; the $1,000,000 spent in drainage in this county having changed the clay and made it an aid to road-making.

2. That great quantities of the best of gravel are found in the bed of the River Thames above Chatham and in other localities, apart from the great ridge on the south.

3. That owing to the increased facilities for getting gravel, and that it can be put on the top, roads can be made very much cheaper than was supposed; so much so that it is not improbable that the roads along the Thames on the N. and S. sides from Chatham to Kent Bridge, may be made at $1,000 a mile. If this be so a perfect revolution in our county is at hand. In Zone and around Bothwell they have got down as low as $300 a mile, and in one case by voluntary work $150 a mile There is no reason why any leading road in the county may not be made within the coming summer with the improved machinery and the number of contributors towards it under the proposed bill for (1) There would be the property owners on the line; (2) Those adjoining; (3) The township; (4) The railways; (5) The towns or villages to and from which road leads; (6) The county. When you take these six sets of ratepayers you see how slight the charge would be.

It is estimated that in this township (Tilbury) and others through which the ridge passes, roads may be made with a traction engine at the rate of 75 cents per yard equal to a cost of $500 to each 100 acres, and that a fair assessment for each of the owners on the front or either side of the road would be $100; $50 on the next range, and $20 on the third, which would be $340, and leave $160 to be made up by the township, town, village, county and railways. This upon the *equal instalment* plan, extended over 50 years, with money at 5 per cent. the owner of 100 acres would have to pay $5.45 each year; the other $2.75; the third, $1.09.

The question of maintenance may be left to the different contributors, as the engineer may appoint. Now, every farmer is interested in this road-making, because he could send his team to the gravel pit and get paid for that at the rate of $3 per day, and he could in two days' work pay his first year's assessment on the $100, so for each year that he worked two days additional; and so with those adjoining; so that a few days' labor would pay two or three years' assessment.

Could anything be more attractive in the way of road-making, and if it should be found that clay can be utilized, as it is in many states, for making suitable brick for roads, a grand industry would be opened up throughout the county.

With these institutes you can accomplish great results; for with our admirable municipal machinery, and with this bill added to the Municipal Act, the enormous losses to the county each year through bad roads may be a thing of the past after this year, and Kent take her true position among the most progressive and prosperous counties in Ontario; and surely it must be admitted that I have Providence on my side this winter in exhibiting the necessity for good hard roads that would make the people independent of rain, frost or snow, for, I think I may, with confidence, challenge any man in this house (not excepting the learned professors and the ever ready M.P.'s and M.P.P.'s) to estimate the loss to this county and the adjoining ones of Essex and Lambton, of this open winter upon their trade and transportation.

CONSTITUTION

ARTICLE I.

NAME.

The Name of this organization shall be The Ontario Good Roads Association.

ARTICLE II.

OBJECTS.

The objects of the organization shall be to awaken general interest in the improvement of public roads; determine the best methods of building and maintaining them; secure the legislation that may be necessary for their establishment and support, and to conduct and foster such publications as may serve these purposes.

ARTICLE III.

MEMBERSHIP.

The Association shall be organized primarily in the township districts of each county, and its membership shall be open to all citizens. There shall be no initiation fee nor membership dues other than the amount required to furnish each member at club rates with the publications of the Association.

ARTICLE IV.

OFFICERS.

The Officers of the Association shall be a President, First and Second Vice-Presidents, Secretary-Treasurer, a Councillor from each County, and from the Central Farmers' Institute, the Eastern and Western Dairymen's, the Creamery and Cheesemen's Associations.

ARTICLE V.

TEMPORARY ORGANIZATION.

For the first year, or until a representative assembly of the Association can be convened, the officers named shall be chosen by ballot.

ARTICLE VI.

THE GENERAL BOARD.

The General Board shall consist of the Executive Officers and Councillors, and shall have power to fill all vacancies in its own body. Fifteen shall constitute a quorum at any regular or properly called meeting of the Board.

ARTICLE VII.

EXECUTIVE COMMITTEE.

The Executive Committee shall consist of the General Executive Officers and ten other members. Five members of the Committee, including a majority of the General Executive Officers, shall constitute a quorum.

ARTICLE VIII.

HEADQUARTERS.

The Head quarters of the Association shall be in Toronto for General meetings only; the office of the Secretary to be where he resides.

PLANS AND PURPOSES OF THE ASSOCIATION.

1. To combine, as far as practicable, the efforts of all persons engaged in the work of road reform.

2. To awaken interest in the subject among the people at large.

3. To receive, publish and discuss any well-considered plans for local, provincial or national action or legislation.

4. To aid in providing for a proper road exhibit and instruction in road making at all Farmers' Institute, County, Dairymen, Creamery, Cheesemen and other Association meetings.

5. To establish the Association on the broadest possible basis throughout the country, so that its influence may be of weight in any direction in which it may ultimately be thrown.

6. To obtain and spread among the local associations full information regarding recent legislation for road improvement.

7. To obtain and publish full information regarding methods of road building as practiced in various parts of Canada, the United States and other countries.

8. To procure and furnish to local associations, at reduced prices, all valuable publications on the subject of roads and road legislation.

The management does not feel authorized to adopt any line of policy, or commit the association to any special scheme that might antagonize the partizans of others, and thus defeat its immediate purpose to unite and solidify the movement.

The immediate formation of County Associations is recommended as a step towards the spread of the organization into townships and school districts. County Secretaries will be appointed by the Executive Committee upon the recommendation of prominent citizens.

Until the county and other associations are fully organized, all correspondence will be conducted through the general headquarters.

All county and local associations are at liberty to act independently in local matters of road improvement, and will be supported by the provincial organization as far as it is practicable.

The local associations are expected to meet occasionally and discuss the papers sent to them and the general subject, and forward their suggestions to the provincial headquarters for consideration and publication, if they are novel and important; to push the work of organization and education in their vicinity, and when the organization is sufficiently advanced, to send delegates to a general assembly of the associations to choose a permanent management, and take such action as may promote the general purposes of the movement.

APPENDIX.

COMMON COUNTRY ROADS.

[The Ontario Department of Agriculture is indebted to Mr. Isaac B. Potter of New York, Editor of *Good Roads*, for permission to use the following extracts from the pamphlet prepared by him and entitled "Country Roads." The pamphlet is copyrighted, and is published by the New York State Division of the L. A. W.]

The country road is part of the machinery of agriculture; just as the steel track is part of the machinery of the railroad. The farm wagon should pass over the surface of the road, and every pound of effort spent in dragging heavy loads through the deep mire is a waste which every farmer should strive to avoid.

Draining of Roads.

Mud is the greatest obstacle to the travel and traffic of the farmer. Mud is a mixture of dirt and water. The dirt is always to be found in the roadway; and the water, which comes in rain, and snow and frost, softens it; horses and wagons knead it and mix it, and it soon gets into so bad a condition that a fairly loaded wagon cannot be hauled through it. We cannot prevent the coming of this water, and it only remains for us to get rid of it as soon as possible. Very few of us know how great an amount of water falls upon a country road, and it may surprise some of us to be told that on each mile of an ordinary country highway (three rods wide) there falls each year an average of twenty-seven thousand tons of water. Water is a heavy, limpid fluid; hard to confine and easy to let loose. It is always seeking for a chance to run down hill; always seeking to find its lowest level. In the ordinary country dirt road the water seems to stick and stay as if there was

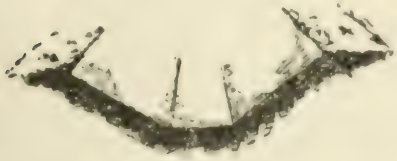


Fig. 1.

Showing proper form of ditch to be dug along the side of the country road. The sides are broad and flaring and have slopes of "1½ to 1"; that is, the slope extends outward a horizontal distance of 1½ feet for each one foot of vertical rise.

Fig. 2.

Showing form of side ditch frequently seen along country roads. The sides of the ditch are too steep and quickly "cave in" at sides and edges, thus obstructing the flow of water at the bottom. This form of ditch is also dangerous to travellers.

no other place for it: and this is only because we have never given it a fair opportunity to run out of the dirt and find its level in other places. We cannot make a hard road out of soft mud, and no amount of labor and machinery will make a good dirt road that will *stay good* unless some plan is adopted to get rid of the surplus water. To state it briefly, *drainage is the first and most important thing to be attended to.*

Side Ditches.

The road must have side ditches, of course. Side ditches catch the water which runs from the surface of the roadway and from the surface of the ground on each side of the road; they also receive the drifts of snow which are scraped from the roadway in winter, and the water which comes from melting snow and ice in the spring. A side ditch should have a gradually falling and even grade at the bottom, and broad, flaring sides. Look at Fig. 1. It shows you the form which a side ditch should have. Its banks will not cave in. It can be easily cleared of snow, weeds and rubbish; the water will run into it easily from each side, and it is not dangerous to wagons and foot travellers. It is therefore a much better ditch than the one shown in Fig. 2, which represents the kind of ditch very often found along the country roadside.

To make the ditch shown in Fig. 1, and to make it with even flaring sides, so as to produce a workmanlike job, we had better use a rough gauge like that shown in Fig. 3.

This gauge is made to fit the proper cross section of a good surface ditch, and by "fitting" it in the ditch as we go along, the shape of the ditch will be kept uniform and correct. The gauge can be made of any convenient strips of wood. The upright strip is four feet long. The horizontal strip is 18 inches long from the left side of the upright piece (as you face the figure) to the point of gauge at the extreme right, and the top of the horizontal strip is one foot above the bottom point of the gauge.

Location of Side Ditches.

If possible the side ditch should be about three feet from the edge of the travelled roadway, and there should generally be a side ditch on each side. If the travelled roadway is fourteen feet wide, there will then be twenty feet of clear space between the ditches; if the travelled roadway is sixteen feet wide, there will be twenty-two feet of clear space. Now and then we shall find a place where the roadway is too narrow for these figures, and in such cases we may have to get along with a single ditch and a narrow roadway. *The best rule is the rule of common sense.*

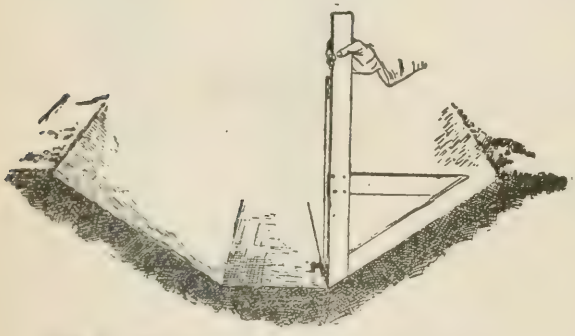


Fig. 3. Showing how the Ditch Gauge is Used.

The bottom of the ditch may be from six inches to one foot wide. The gauge is provided with a plumb line, fastened to the upright strip, as shown in the figure, and by this means the upright piece is held vertical and the slopes made to correspond with the edge of the diagonal strip.

Sometimes side ditches are entirely omitted and the shallow gutters at the sides of the wagonway are depended upon to carry off the surface water. These gutters sometimes serve a good purpose, especially when made in regular shape and with good grade (as can be

done with a good road machine), but they are likely to clog and be destroyed by passing wagons, and for this reason alone it is better to make one or more separate ditches when possible.

Common side ditches catch surface water, and surface water alone. When the surface of the roadway becomes rough and rutty by the passing of waggons, the ruts and low places hold the water and prevent its passage into the side ditches, and although these ditches carry most of the water which falls, there is often enough left in the roadway to create deep mud and produce much harm. In spring the frozen ground prevents the water from passing downward into the soil, and it remains to form mud on the surface.

Under-Drains.

No way has yet been found of getting entirely rid of this mud but in nearly every dirt road we can secure great improvement and obtain a dry road nearly the year round by the use of a single line of under-drain It is safe to say that there is scarcely a dirt road in the country which cannot be so improved by under-draining as to yield benefits to the farmer a hundred times greater in value than the cost of the drain itself.

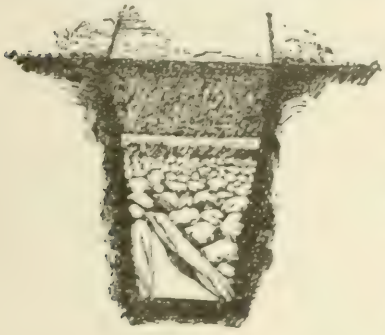


Fig. 4.

Showing form of under-drain made with field stone. The ditch is first dug and carefully graded at the bottom; then large flat stones are carefully placed at the bottom so as to form a clear passage of good size for the flow of water. The ditch is then half filled with rough field stone (with small stone on top), and on these a layer of sod is placed with the grass side downward. The rest of the ditch is filled with earth. If sod is not to be had, fine brush, hay or straw may be used instead.

Under-drains are cheap, and are easily made. If made in a substantial way and according to the rules of common sense, a good under-drain will last for a generation without repairs. It is best and cheapest to use drain tiles when possible; but if, for any reason, we cannot use tiles, common field stone may be used instead. The drain ditch should be dug in a line parallel with the road, and it may be either in the centre of the roadway or on one side of it. If the ground is soft and "springy" it is all the more necessary that an under-drain should be laid. If it cannot be laid in the centre of the road without seriously interfering with the passage of waggons, the ditch can be dug on one side of the roadway and between the roadway and the ditch. It should not be less than four feet deep from level of land before road-bed is rounded up, and this depth will in most cases be about right. If we decide to use field stones, we should select flat ones to form the opening or channel at the bottom of the drain, and they should be laid with care so as to leave a good sized opening, as shown in Fig. 4. The method of building this drain is described briefly in the text under the figure. In laying all drains, begin at the lower or downstream end, so that whatever water runs into the ditch will be carried out through the drain as you go along with your work.

Tile Drains.

If a tile drain is used we must select hard burned tiles such as are used for farm drains, and in most cases a three inch tile will generally be large enough to completely drain the soil beneath the roadway. Such a tile will pass about thirty-five gallons of water per minute when laid on a grade having six inches fall per hundred feet. But a larger drain is never out of place in a roadway, and it is

better in some ways than the smaller one. It admits more freely the warm air in spring, and hastens the thawing of the frost and the drying of the road.

Drain tiles are made in different forms. The round tile is generally the best, although some people prefer a form known as "sole tile," because it has flattened upper and lower surfaces. This advantage is more imaginary than real, as the round tile is more easily fitted end to end; and besides this the round tile is always lighter, less bulky, and can be carried about at less expense and with less labor. The price of the two is about the same

If we decide to lay our under-drain along the centre of the road, we may, if a good quality of gravel is found in the neighborhood, get a very good roadway by following the plans shown in Fig. 6, in which the method of construction is briefly described under the figure. If no gravel is found, and the earth is of a clayey and sticky kind, we may follow the plan described on page 48.

The Surface.

The surface of the road should be smooth, for smoothness means easy hauling. The surface of the road should be hard, for hardness prevents the formation of ruts and the sinking of wheels into the surface. Besides a hard road surface will shed water quickly, and if water is quickly carried off, the roadway will be kept dry, and the formation of mud holes avoided.

A plow should not be used in working a dirt road except when actually necessary, because a plowed surface is difficult to make smooth and hard and the plow is likely to cut too deeply into the earth. We should, by all means, have a good road machine if possible. These machines are sometimes called "scrapers" and sometimes "graders." A good road machine will do the work of twenty laborers, and when put to its best will do the work of forty. Besides, it will be done uniformly and thoroughly. The best time to use a road machine is when the road is not too dry, and the best way to use it depends upon the machine we are using. Each manufacturer aims to get the best work out of his machine, and to use it so as to give the best satisfaction to the buyer. He will tell us how to use it to the best advantage, and by following his directions as closely as possible, we shall be sure not to go far astray.

The following points taken from the printed instructions sent out by one of our leading road machine companies, will be found generally useful:

Suggestions to Operators and Points to be Considered in Selecting a Road Machine.

To the fair-minded, intelligent road official of the present day, there is no question as to the many advantages of road machinery over any other method of repairing dirt roads.

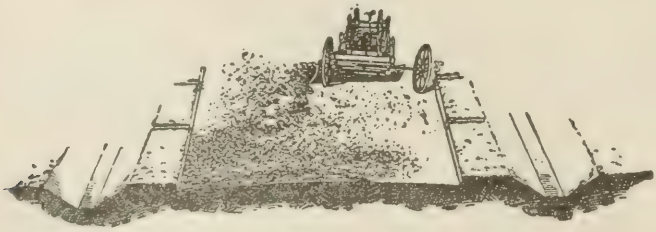


Fig. 5.

Showing proper form of country dirt road. There may be only one side ditch when space is scant, but two are always better. A strip of sod three feet wide runs along between the ditch and roadway. The roadway may be from eight to fifteen feet wide, according to the amount of travel, and is connected with the side ditches by short drain ditches, running across the grass strip at frequent intervals. The figure shows a road machine employed in repairing the roadway.

Besides doing the work at less than half the cost, vastly better results are obtained. The difference between the results obtained by the use of a road machine and the old-fashioned plow and shovel method is clearly defined. A road machine of recognized merit will plow an even ditch of uniform depth, and will plow where an ordinary plow will not enter the soil. The scraping blade of the machine moves the earth from the ditch to the middle of the road, distributing it evenly and leaving the road-bed smooth, without any of those little bumps and holes which characterize a road repaired in the old-fashioned manner. These bumps and holes, small at first, will wear larger, and soon develop into good sized ruts, making the road very unpleasant to travel over.

It is conceded that a good reversible machine will do the work of from thirty to forty men in the ordinary work of road construction thus effecting a saving of more than one-half over the old methods.

Suggestions to Operators.

In the work of operating a road machine, as in everything else, experience is the best teacher. . . Machines are so simply constructed that any man with ordinary intelligence, after he has acquainted himself with the different adjustments, will, with a very little practice, be able to operate the machine well under all circumstances. A slow, strong motion is indispensable to good work.

Repairing.

A little timely work done in the right way is like "the stitch in time that saves nine." No matter how nicely and well a road has been made, travel, rain and frost all combine to destroy it.

Fig. 6. A Gravel Roadway with Under-Drain.

When clean gravel of good quality is used, this makes a very excellent form of country road. The centre drain may be either of field stone or tile, and is made as already described in Fig. 4. The gravel should be clean and "sharp"—so as to pack and drain quickly and should contain but very little soft earth, which always holds water and forms mud. A gravel road is always improved by keeping the surface in proper form and by rolling with a heavy roller.

There is hardly a month in the open season when the road machine cannot be used to advantage in the road; but spring is the best time to do efficient work, because the soil is loose, and roots of grass and weeds do not interfere. Every spring, before the ground becomes too hard, the road should be gone over thoroughly with a road machine, the ditches cleaned out, so that water may have a free outlet; ruts and holes filled, elevations in the road and the shoulders on the side of the road planed off, the grade improved and the road put in good condition generally. In repairing a road which is in fair condition, commence at the ditch and work towards the centre, scraping lightly with the entire length of the blade, till the last rounds in the middle of the road, when the rear end of the blade is carried high enough to allow the earth to distribute under it. To make the blade penetrate very hard, stony ground, it may be best to use only the point, elevating the rear end considerably. The best finish can be obtained in sod

ground by first cutting the sod as thin as possible, then placing them in the middle of the road, and finally going back to the ditch and bringing up earth and levelling over the sods. Ruts or depressions that are too deep to be filled with the machine should be filled in with gravel. Do not fill in more than is necessary—only sufficient to fill the holes.

When gravel or sand cannot be obtained the improvement of a clay road is sometimes difficult. A good under-drain may be laid along the centre of the road and the earth removed from the roadway to a depth of about one foot at the centre, from which point the excavation should rise by a gradual slope to each side. On the bottom of this excavation a layer or bed of hay, straw or coarse grass should be laid to a depth of about four inches (when compacted) and the earth should then be filled in and formed to the true shape of the roadway. This method of treatment will tend to keep the roadway dry and prevent the formation of mud. When the road runs down hill the short ditches connecting the roadway with the side ditches are made with a diagonal pitch down the grade so as to catch the running water in the roadway and carry it to the side ditches.

How to Build New Roads.

In building new roads with a machine first mark out your ditches the full width, plowing a light furrow with the point of the blade, carrying the rear end well elevated. On the second round drive the wheels in line with the point along the hollow made the first round, plowing a full furrow with the advance end of the blade, dropping the rear end somewhat lower than before. The third time round move over towards the middle of the road the earth previously plowed. Then return to the ditch and plow it out deeper, moving the earth towards the middle whenever as much earth is plowed as the machine can move at once. Repeat this until the ditches are the proper depth, and the road as full and round as required; then surface off as directed in repairing.

Points to be Considered in Selecting a Road Machine.

In the selection of a road machine the following points should be carefully considered:

1. Thoroughness and simplicity of its mechanical construction. 2. Material and workmanship used in its construction. 3. Ease of operation. 4. Lightness of draught. 5. Adaptability for doing general road work, ditching, etc. 6. Safety to the operator.

Width of Travelled Roadway.

The travelled part of the road should be of uniform width, and the two sides should be parallel, if possible. Sometimes a width of ten feet will be enough; but sixteen feet is about right where much travel is to be provided for. It will be seen in this figure that the work of the road machine has formed two gutters on the outer edges of the road and these gutters are sometimes depended on to provide for all the surface drainage of the roadway. As a general rule, it may be said that this form of construction is cheap and faulty. These shallow gutters or ditches become easily clogged by passing wagons and by loose dirt. They are not large enough to contain and carry off all the water of heavy rains and melting snows, and for this reason the surface ditches described in the preceding chapter should not be omitted. These surface ditches should be connected with the roadway by narrow surface drains placed about ten yards apart along the line of the road, and on all steep grades these narrow drains should run diagon-

ally downward from the roadway to the surface ditch. If made in this form they will catch the water easily as it runs down the hill, and carry it quickly into the side ditch, where it properly belongs.

Form of Cross Section.

The cross section of the road surface should slope in straight lines from the centre to either side. If slightly rounded, no harm will be done, but if much rounded the wagons will naturally follow each other along the centre of the roadway and avoid the steeper parts at the sides.

Rolling.

Every road is made smoother and harder by rolling, and dirt roads are no exception to this rule. We have all noticed that the hardest and smoothest parts of a country road are the narrow strips which mark the passage of the wagon wheels that have gone over it, and these parts have become hard and smooth because the wheels have acted as rollers. But a wagon wheel is not always a very satisfactory roller, for the reason that the wheel tires are too narrow, and when the road is wet and soft the narrow wheels sink into the surface and form ruts, and cut and mix and mangle the dirt out of all reason, and destroy the good qualities of the roadway. If all the wagons used on country roads could be provided with tires four inches wide, they would roll the surface more smoothly and more quickly, and it would be in fairly good condition for nearly the whole year round. A good horse roller will serve much to cure this difficulty.

Rolling should follow closely upon the work of the road grader or scraper, so as to consolidate all the loose earth which the action of the scraper has laid in the line of the roadway. The roller should pass many times over the softer portions of the road, and where the road is very dry and not inclined to peck it may be slightly moistened to hasten the action of the roller. The rolling should begin at the sides of the road and work gradually towards the centre; that is, the roller should be passed from end to end along the side of the road and then the second passage of the roller should slightly lap the first until the centre of the road is reached.

The Earth in the Roadway.

Clean gravel is always desirable, and should be used whenever it can be obtained. If the soil in the roadway is found to be of a sticky, clayey nature, we can improve it greatly by adding a few inches of sand, and repeating this operation every few months, as the sand works into the clay. If the soil is composed of loose sand we can greatly improve the road by adding a layer of five or six inches of stiff clay.

In the first instance the sand tends to counteract the stiff and sticky qualities of the clay, and in the second case the adhesive quality of the clay counteracts the looseness and shiftiness of the sand and helps to stiffen it and hold it together. A little study and application of common-place rules in each locality, aided by a few experiments, will generally enable us to arrange the clay and sand so as to give the best results.

Cross Drains and Culverts.

Here and there along nearly every country road we find a place where the roadway is crossed by a small stream; and where the stream is not so large as to demand the construction of a bridge or a culvert a small cross drain may be used

as a channel to conduct the water across the road; but this drain should be substantially made, so as to be solid and permanent, for the caving in or washing out of a badly built drain has broken the leg of many a good horse, and has brought disaster to many a traveller who has staked his faith on the fidelity of a shiftless and incompetent pathmaster and gone abroad at night on the country highway.

Wooden Cross Drains.

Wood is perishable and is not well adapted to the making of drains, but it is cheap and in many localities it is the only available material from which a drain can be made at a reasonable cost. If stone cannot be had and drain pipe is out of the question, a substantial cross drain can be made of flattened timbers and planks as shown in Fig. 7. In making this drain the trench is dug across the road in the line of the drain and of sufficient depth and width to contain the timber and planks. Then the bottom is carefully formed so as to make a smooth, solid foundation, having a slight grade or pitch in the direction in which the water is to run. Two flattened timbers are then laid at some convenient point on the roadway near the drain and so placed as to be parallel with each other and as far apart in the clear as they designed to be when placed in the drain. A course of three-inch plank is then spiked across these timbers from end to end, using 50-penny nails for this work, until the course of planks extends from end to end of the timbers. This row of planks is to be the bottom of the drain, and when the short bottom planks are securely spiked to the timbers, the timbers are turned over (thus bringing the planks at the bottom) and placed in the pit dug to receive them. After this is done another pair of flattened timbers are placed on the top of the first course already in place, and three-quarter inch auger holes bored through the centre of the top timber and half way through the bottom one, about three feet apart throughout their entire length. Into these auger holes should be driven, securely, drift bolts, three-quarters of an inch square, and of sufficient length to fill the auger holes, and the timbers are thus securely fastened together. In the same way, if necessary, another course of timber is put on top of the ones already in place, till the drain walls reach the height of the surface of the road, after which another course of three-inch plank is securely spiked crosswise over the top of the drain, and, over this, for greater strength and permanence, it may be well to spike a layer of three-inch plank endwise across the roadway or at right angles with the shorter planks which are spiked directly to the timbers.

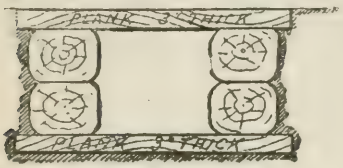


Fig. 7. Wooden Cross Drain.

Other forms of wooden culvert will suggest themselves to the ingenious mechanic, and no single plan can be suggested which may not be more or less modified to advantage to meet the conditions presented in different localities.

Pipe Culverts.

A good pipe cross drain or culvert will last for many years and will supply a regular and sufficient water-way, and one that is easily cleaned; and if the top of the pipe is set a foot or more below the surface of the road, so as not to be injured by contact with the wagon wheels and horses' feet that pass over it, such a drain is probably the best that can be used on a common dirt road. Cement pipe may sometimes be used to advantage if made by a reliable manufacturer; but vitrified stone pipe is generally more reliable and more durable. Only the "salt glazed" pipe should be used.

When pipe is used for a cross drain or culvert a substantial face wall or abutment should be built at each end to contain and protect the ends of the pipe. The bottom of the abutment should be located far enough below the bottom of the pipe to escape the effects of frost which might heave and disrupt it.

These face walls or abutments may be made of common rubble masonry, in which the stone should be laid in strong cement mortar and well bonded.

If our roadway is provided with a centre drain, or if an under-drain has been placed at either side of the road, we had better put branch pipes in the line of our culvert to receive the water from the under-drain in the roadway.

Each length of drain pipe has a "socket" end into which the plain end of another length is made to fit. In laying the pipe drain the bottom of the trench in which it is laid should be made solid, and should have a form and grade corresponding to the form and grade of the pipe which it is to contain, and little "hollows" should be scooped out across the bottom of the trench into which the sockets or collars of the pipes will fit, so as to permit the body of the pipe to rest on a firm bearing at the bottom and sides of the trench. If the ground is sandy, or of so loose a nature that these depressions or hollows cannot be scooped out, it will be necessary to lay the pipe to grade throughout the length of the drain ditch; then ram the loose sand or earth beneath and around the lower half of each pipe, so as to give it a firm bearing.

The joints of the pipes are sometimes cemented, but there is some difference of opinion on this point, and in most cases it will answer quite as well to cover them securely with stiff clay well packed around the joints.

Stone Culverts.

In some localities good stone is plentiful and cheap, and this fact, with perhaps other local considerations, will sometimes make it seem best to reject the use of pipe and to construct a stone culvert. In nearly every case rough rubble masonry will answer every purpose.

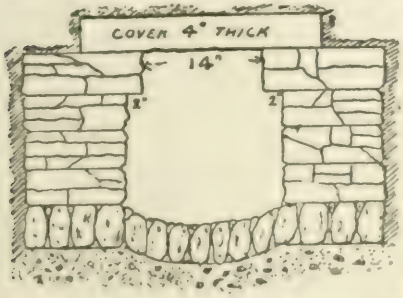


Fig. 8. Showing cross section of ordinary stone culvert.

The following brief suggestions will aid the reader in the general work of planning and overseeing the construction of a stone culvert: As already stated, rough rubble masonry will answer every purpose in making the culvert for an ordinary dirt road, but in laying the stone work plenty of "headers" should be used, so as to give the stone a strong bond, and heavy stones should be used at the angles of the up-stream end of the culvert to resist the action of flood trash and floating ice in the season of heavy freshets. The opening or water-way of the culvert should be ample to admit of the passage of large bodies of water; the bottom of the opening should be paved with stones set on edge and given a downward curve in the centre, something after the style of an inverted arch.

The cover or top stone of the culvert should be at least several inches below the surface of the roadway, and the bottom of the culvert foundation should be below the frost line.

On this subject of drains and culverts, it may be well for the reader to know something of the question of rainfall. Each culvert or drain will naturally be required to pass an amount of water which comes from the adjacent "water shed" (or land from which the water will flow toward and through the culvert). One inch of rainfall per hour indicates a heavy downpour. This amount gives,

in round numbers, 23,000 gallons of water per acre per hour, or about 377 gallons per minute per acre. Much of this water will, of course, be held back by various obstacles, and not more than 70 per cent. will reach the culvert in the hour in which it falls. If a certain water shed is composed of a thousand acres, then the heaviest rainstorm will pour out upon this water shed about 377,000 gallons per minute, and if the water shed is made up of steep side hills and rocky slopes the water will run off quickly and reach the culvert soon after it falls; while, on the contrary, if the water shed is composed of flat lands, gentle slopes and porous soils, the water will reach the culvert more gradually, and much of it will be absorbed by the earth.

If drain pipe should be used, it is well to remember that where the road surface is only a short distance above the culvert stream, and the road-maker is thus prevented from using a large pipe, as he otherwise would select, he may avoid the difficulty by using two or more lines of pipe, laid side by side across the roadway, building them into the abutment at each end, as already described in the case of a single pipe.

Conclusion.

Many people who have not studied the subject of improved roads do not understand the immense benefit which they bring to a community; yet, of all the thousands of miles of good roads that have been made in this and other countries, the first mile has not yet been found that has not proved to be profitable. The increase in land values alone is always more than enough to pay for the improvement. Some benefits and advantages we cannot always compute in dollars and cents, and some things our common sense impels us to take for granted. No farmer in this country can tell the money value of an education, and yet each farmer concedes its value and sends his children to school, and watches carefully their advancement in knowledge. Good health is of infinite value, and the farmer seeks it and guards it, but he cannot tell its value in dollars and cents. The same is true of good habits, good morals and good clothes. Do not, therefore, waste any time in doubting the value of a good road. The people of other countries who have used bad roads and now use good ones are well satisfied that every dollar spent in this work is a good investment, and not one of them would tolerate the miserable dirt roads with which so many farmers seem to be content.

THE MAKING OF ROADS.

Prepared by James A. Bell, P.L.S., Mem. Can. Soc. C.E., St. Thomas, Ont. Under Instruction from the Minister of Agriculture.

During the past decade there has been a marked improvement in our railways, municipal buildings, country residences and farm buildings, but the question of improving our country roads has not received the attention that its great importance demands. One reason for this is, that attention has been directed principally to the securing of lines of railway throughout the different municipalities. Having now secured the advantage of railways for the shipment of farm produce and the bringing in of farm supplies, it is of the greatest importance that the roads leading to these railways be placed in first-class condition. The benefits to be derived from having good roads to the markets are so numerous and so apparent that little need be said in advocating them. Good roads enable the farmer to market his produce at all times, to take advantage of changes in market prices, and to utilize time that cannot be given to other farm work; they enable him to market his produce and secure his supplies at less expense for hauling, with less wear and tear to vehicles, and with less injury to animals. The improvement of roads results in bringing more closely together the members of the agricultural community, and thereby increases the social intercourse of farmers. In a word, the construction of better roads brings the farmers closer to their markets and closer to one another, the financial, social and moral advantages of which are well understood by all.

The question of how to provide the funds for improving our roads will not be dealt with here; nor will that of the much discussed question of statute labor. These questions must be settled by each municipality for itself. The intention is to give some information that will enable those having the construction and supervision of roads in charge to undertake and carry out the work on a uniform plan, and in such a manner that money and labor will be expended to the best advantage.

Grades.

The grade of the road is a very important element in its construction, and should be decided upon before the other works are commenced. In determining the grade, the necessary fall to carry off the water in the side ditches must be considered. There should be a fall in the ditch of at least 3 inches in 100 feet, and necessarily the road should be on the same grade; aside from this point, the road should be as level as possible. In order to show the advantages of having a road as nearly level as possible the following table made from experiments by noted engineers shows the difference of draught on different grades. Call the load which a horse can draw on a level 100.

Then on a grade of	1	in	100	a horse can pull		90
"	"	1	" 50	"	"	81
"	"	1	" 40	"	"	72
"	"	1	" 30	"	"	64
"	"	1	" 26	"	"	54
"	"	1	" 20	"	"	40
"	"	1	" 10	"	"	25

From this table it will be seen that a horse pulling a maximum load on a level can pull only four-fifths as much on a grade of 1 in 50; three-fourths as

much in a grade of 1 in 40, and one-fourth as much on a grade of 1 in 10. In determining the grades of roads keep well in mind the following: 1. Never make a road ascend one foot more than is absolutely necessary. 2. Economy in maintenance depends on easy grades. 3. Hilly roads are full of danger, expensive to maintain, and destructive to horses.

If roads were classified as follows: First, leading roads, that is roads leading to or connecting cities, towns, villages or principal shipping points; second, the principal roads contributory to the above; third, what are called back roads, not much travelled; then the grade of the first should not exceed 5 feet in 100 feet, the grade of the second should not exceed 7 in 100 and the grade of the third should not exceed 10 in 100.

Any grades steeper than the above should be used only for light driving. Although the above grades should not be exceeded, still it is evident that no fixed gradient can be adopted in all situations; the question of the cost of construction is an item that must be considered. In this province the road allowances were mostly laid out without considering the practicability or impracticability of constructing roads upon them. Most of those road allowances have been opened and are travelled upon, and it is not very easy to now change the location of them. The question to be considered is how to make on these lines the best road under the circumstances. Economy of motive power must be carefully considered, and also cost of construction. These two in most cases will be antagonistic to each other and the merits of each will have to be weighed and decided upon by the person in charge of the work. Sir John McNeill asserts, that "if a road has no greater inclinations than one in forty there is twenty per cent. less cost for maintenance than where the inclination of the road is one in twenty. The additional cost is due not only to the greater injury by the action of the horses' feet on the steeper gradient, but also to the greater fatigue of the road by the more frequent necessity for the sledging or braking the wheels in descent." John Maclennan, for some years president of the Association of Road Surveyors for Scotland says, "Gradients should not exceed one in forty. Easy gradients are preferable to dead levels, securing drier and more compact roads."

Foundations.

The stability and permanence of any structure depends upon its foundation; so it is with roads. A poor foundation will soon make a poor surface; the best material may be used but it will soon get into holes, ruts and depressions if the foundation is bad. One of the main essentials for a good road foundation is thorough drainage, both surface and subsoil. It is quite impracticable to construct successfully a good road with any kind of material on a soil that is filled with water having no outlet. Therefore, the first thing to be done in making a road after the grade is established, is to remove the water from beneath the road-bed and afford an easy means of its escape from the surface. It is necessary to consider the kind and nature of soil that the road is to be built upon before making provisions for its drainage. Different classes of soil will require different treatment, but in every case it is necessary to thoroughly dry the soil by drainage before proceeding further with the work. Gravels and sands are easily dealt with, as they do not hold water in suspension, but clays and most other soils are more difficult and it requires care and good judgment in most cases to decide on the best means of removing the subsoil water. If the soil is porous and will not hold the water in suspension, then side drains will be sufficient; but if the soil is retentive or springy, then it is necessary that underdrains should be placed along the road, with cut off drains leading to the side ditches at short intervals Underdrains are best constructed of field tile three or four inches in diameter, and

should be at least two and one-half feet deep from the surface. Sometimes one drain along the centre of the road will be sufficient, but two drains are better, one on each side of the finished road-bed.

The joints of the tile should be close, so as to prevent any of the soil from getting into the drain, and they should be filled in with cobble, broken stone, or broken brick, in order to take the soakage from the surface.

Side drains may be constructed open, or where possible it is better to have them also of tile and filled in with stone and gravel.

Fig. 1 shows road-bed with two tile drains, one on each side of the road-bed.

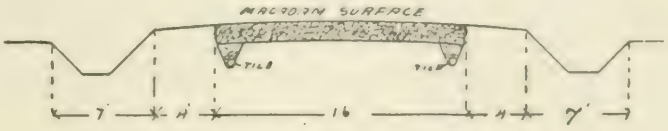


Fig. 1. Showing Cross Section of Road with Centre Drains.

Fig. 2 shows a section of road with open side drains.

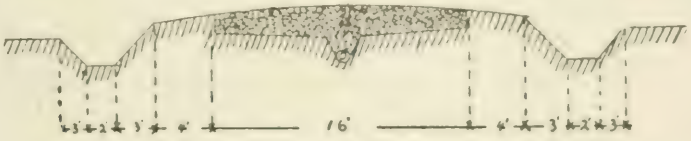


Fig. 2. Cross Section of Road with Centre Tile Drain.

Fig. 3 shows a section with tile filled in with broken stone and gravel.

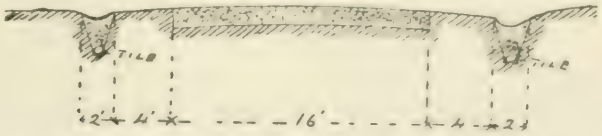


Fig. 3. Cross Section of Road with side Tile Drains.

Side drains should be at least three feet deep from the surface of the road-bed at the centre, and if open, the slope should not be less than 1 to 1, that is, a drain that is three feet deep, and one foot wide in the bottom, should have a top width of seven feet. Where they are filled in it is not necessary to have them so wide. Subsoils of running sand should always have tile drains, as it is impossible to keep an open drain the necessary depth in such soils.

There is one thing about the uses made of open drains along the side of roads that is very objectionable, that is, they are in a great many cases made the receptacle or outlet for as much of the water as possible of the lands lying adjacent to the road. This, probably, is a good thing for the drainage of the lands, but in wet seasons it causes the side drains to be kept continually nearly full of water, which is absorbed by the road-bed to its great injury. Where it is necessary that a system of drainage, for land purposes only, should be carried along the side of a road, the drain should be carried as near the side of the road allowance as possible, and another drain constructed for road purposes as above described. Our road allowances, which are usually 66 feet, are quite wide enough to have this done.

A uniform and sufficient grade in the bottom of the drains is very desirable, and they should at all times be kept in perfect repair. A little attention for a short time will give the sides a sodded bank which will not cave in or wash

away. It is also a good thing to sow the sides of the ditch, when completed, with grass-seed, and thus hasten the sodding of the banks. Culverts should be put in across the road-bed where necessary, and should be made of cast-iron, stone or vitrified fire-clay pipe. Cast-iron water-pipe, which will not stand the pressure for waterworks purposes, can generally be obtained at the pipe foundries at a reduced cost; they are coated with a solution of hot tar, will not rust, and are almost indestructible, and make an excellent culvert at a reasonable expense. They are also very easily constructed, no skilled labor being required to put a culvert of this description in place. All that is necessary is to dig the trench for the culvert the necessary depth, put the pipe together in the trench, see that the small end of the pipe is placed the full depth into the hub of the next pipe, fill in the remaining space around the hub with some stiff clay or cement, and then fill in the trench and ram down the earth around the pipe. Pipe can be procured up to six feet in diameter.

A fet cuts of stone culverts are shown in Figs. 4, 5, 6.

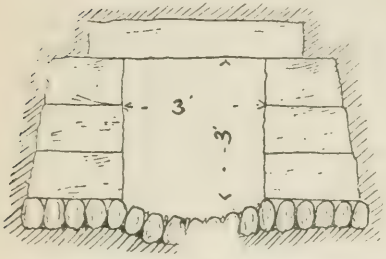


Fig. 4. 3 x 3 feet, Box Culvert.

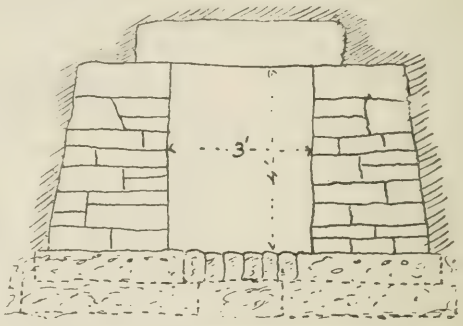


Fig. 5. 3 x 4 feet, Box Culvert.

Hard stone that will not absorb moisture is well adapted for the construction of culverts, but a great deal more care must be exercised in constructing them than in putting in iron culverts. The foundations must be perfectly solid and secure, and the whole work done in a first-class manner, or else the whole structure will sooner or later prove a failure. If the earth foundation is not of a satisfactory description, then concrete or plank should be used to place the stone work on. If it is for a live stream, plank is the cheapest and will not rot under water. The plank should be placed across the line of the culvert, and extend back on each side the full depth of the walls. To prevent the earth from washing away the bottom, it can be cheaply constructed of cobble-stone, as shown in the cuts. Care must always be taken to prevent the water from getting behind the sidewalls; and, where the fall is great, it may be necessary to make an apron of stone at the lower end to prevent the water from washing out the earth after it leaves the culvert. In all cases, unless the stones are large and flat, stonework for culverts should be laïd in the best mortar, composed of hydraulic cement and clean, sharp sand. Larger culverts than shown in the cuts are generally made with an arch, as flagstones larger than shown are not easily procured.

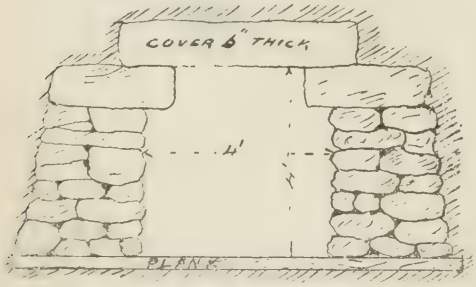


Fig 6. 4 x 4 feet, Box Culvert.

Of late years salt-glazed, vitrified sewer-pipe have been largely used for culverts, and if well laid are well adapted for the purpose. Care must be taken to make the excavation conform as nearly as possible to the shape of the half of the pipe, with proper depressions for the hubs. The joints should be caulked with clay or cement. If this is not done the water may force itself out of the joints and wash the earth from around the pipe. The earth should be carefully and solidly rammed around the pipe, and the upper surface of the pipe should be at least fifteen inches below the surface of the roadway.

The following table shows the size, capacity and price of sewer-pipe in car lots at almost any railroad station in Ontario.

Diam. of pipe. inches.	Capacity. sq. ins.	Weight per foot. lb.	Price per foot. $ c.
6	28	10	13
8	50	16	20
9	63	23	25
10	78	34	30
12	113	44	35
15	177	63	53
18	254	84	80
20	314	100	1 10
24	452	208	1 25

They are now making what is termed "double strength pipes," particularly adapted for culverts; they weigh considerably heavier than the above, and cost about 40 per cent. more per foot.

Drains should be constructed to take the water away freely from the lower end of the culvert, as the freezing of the water in a pipe culvert when over half full is liable to burst it. The use of wood for small culverts is not economical in comparison to culvert pipe; they very soon decay, and are in such cases, to a certain extent, dangerous.

Width of Road-bed.

The width of the road-bed between the side ditches will vary according to the width of metalled surface that is intended to be put upon it, but it should in no case be less than 20 feet (except in fills, which should be fenced). Anything of less width than this, with an open ditch on each side of the road, is somewhat dangerous. Where the metalled surface is to be 16 feet wide, the road-bed should be 24 feet wide, and for a metalled surface of 24 feet the road-bed should be 30 feet wide, unless there is a curb on each side of the metalled portion.

Road-bed.

In preparing the road-bed have all perishable material discarded. The earth taken from the side ditches should be placed upon the road-bed, making the centre higher than the sides and of a convex form, allowing sufficient for sinkage when rolled; the object of this convex shape is to facilitate the flow of the water into the side ditches. Where the metalled surface is to be of stone a small rise is sufficient, for earth roads it should be more. For stone roads the rise should be about one-fortieth of the width of the road-bed; in gravel roads one twenty-fifth, and on earth roads the centre should be at least one foot higher than the sides for a 20-foot road. The above will allow for a slight sinkage by travel. The foundation for the metalled portion should be made of the same shape as that intended for the finished surface. It should be well rolled with either a heavy horse or steam roller, and if any depressions are made they should be filled in and it should be again rolled, until it presents a smooth and unyielding surface. It is then in condition to receive the metal surface decided upon.

Material For Road Surfaces.

The chief requisite of a good material for making and repairing roads is that it should be not only hard, but tough, and that it should be able to stand the wear and tear it will be subjected to, without being crushed by h avy travel. For the best roads the material should be angular and cubical so as to bind well together and leave no space for water to penetrate. The material used will, to a certain extent, depend on the locality, but it is more economical to use the best material even if it has to be brought from a distance. The best material is syenite, basalt, hard volcanic rocks, granite or hard limestone ; sandstones, slate and all soft rocks make very poor road material and should be avoided. Stones with rounded surfaces should not be used, as they have a tendency to work loose when weight is put upon them.

Opinions vary as to the proper size the fragments should be broken to. The old rule was that all stones should pass freely through a $2\frac{1}{2}$-inch ring. Some engineers advocate weight as a standard and recommend the following: Granite and similar rocks, half an ounce to three and a half ounces ; flint and similar stones, three-quarters of an ounce to five ounces ; lime-stone and similar stones, one ounce to six ounces ; one-half of the above to be of the maximum weight, one-eighth of the minimum weight, and the remainder between the two. There is no doubt that hard and tough rocks should be broken into smaller fragments than soft rocks. The upper surface of the road should have the fragments broken as nearly of a size as possible, and should not be larger than will pass through a 2-inch ring, or smaller than will pass through a $1\frac{1}{4}$-inch ring. If it is difficult and too expensive to procure all hard rock for the road-bed, then place the softer rock in the bottom and make the surface layer of about $2\frac{1}{2}$ or 3 inches of good wearing material.

Road Surfaces.

Road surfaces outside of pavements may be considered under the heads of Telford, Macadam and gravel roads.

Telford Roads. The modern system of making Telford roads differs considerably from that laid down by the inventor, and is practically as follows: On the well-rolled earth foundation, stones about 4 inches wide, 6 inches thick and 8 to 12 inches long are set by hand on their flattest sides, the longest side laid across the road, and in straight rows, the stones to break joint. In the space between the larger stones smaller stones and chippings are firmly wedged ; any irregular upper edges of the large stones are sledged off. When finished it presents a slightly roughened surface; this surface should also be well rolled. After the completion of this sub-pavement, at least two separate layers of broken stone are put on. The stones used in the next layer may be from 1 to 3 inches in diameter. This layer should be about 4 inches thick, and should be spread evenly to conform to the finished surface. A small quantity of coarse sand should be spread on this course, sufficient to fill the interstices and act as a binder, and then it should be well and thoroughly rolled after first being sprinkled with water. The top or finished course should be of smaller stone, not over $1\frac{1}{2}$ inches diameter, such as would pass through a 2-inch ring. Great care should be exercised in selecting this layer, as in the quality of the stone depends the life of the road surface. All the stones should be of a uniform size This course should be at least 3 inches thick, and after being lightly rolled, should be sprinkled with coarse sand or stone screenings from the quarry, watered, and constantly rolled with a heavy roller until it is pressed into a smooth compact mass, so that no more sand or screenings can be pressed into the spaces. In rolling always roll the outside first, parallel

with the road, working towards the centre. Fig. 7 shows a cross section of Telford roadway for an eight foot surface.

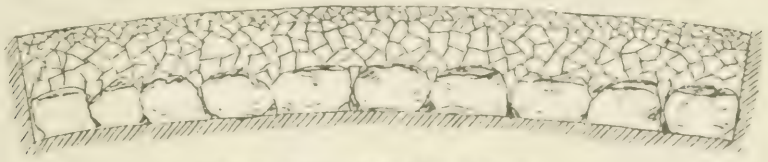


Fig. 7. Section Telford Road Surface.

Macadam Roads. In this, as in the former case, modern road builders have departed from the rules laid down by the inventor. Macadam roads are undoubtedly inferior to Telford roads for locomotion where heavy traffic is to be provided for; but, when made carefully, are infinitely superior to gravel roads, and are well adapted for rural districts where the travel is not too heavy. In the construction of Macadam roads it is necessary that the earth foundation should be made to conform to the finished shape of the road; it is also of prime importance that the earth foundation should be well rolled and drained. The metalled surface should be put on in three layers, and each layer well rolled; the last two layers should have the necessary amount of binding material, and should be watered as described for Telford roads. All the stone for the first two layers should be cubical in form and should pass through a 2½-inch ring, and in the top course the stone should pass through a 2-inch ring. The metalled surface in a Macadam road need not exceed, when completed, 9 or 10 inches, and in many locations where the traffic is light 6 or 7 inches will be found sufficient. The finished surface should be completed in the same manner as in Telford roads.

In the top course good clean gravel may be substituted for broken stone, with very good results.

Fig. 8 shows a cross section of a Macadam road.

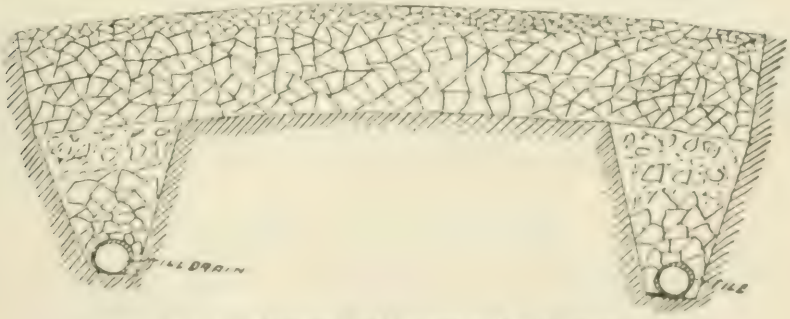


Fig. 8. Macadam Road Surface with Tile Drains.

Gravel Roads. The foundation for gravel roads should be prepared in the same manner and with as great care as that specified for either Telford or Macadam roads. To make a good road of gravel the material must be carefully selected; it should be screened and all stones discarded that will not pass through a 2-inch ring. The large stones afterwards can be broken and used, or they form a first-class material to fill in over the tile drains. Gravel should be put on in two or three layers and each layer thoroughly rolled. The last layer may require a small amount of binding material of course sand in order to make a solid, smooth surface capable of bearing the heaviest loads without cutting or sinking. If the gravel is angular in shape, hard and of uniform size, it will make a hard, durable road-bed.

The usual way adopted in making gravel roads is to grade the road with dump scrapers and, before it has time to get packed by travel, to put on the gravel, a load or a load and a half to every 9 feet; this is heaped in the centre of the road to a width of about 6 feet, and left in such a condition that it is almost impossible to travel upon it. The consequence is that the travelling public do not attempt to drive on it, but use the sides of the road until they are so cut up as to be impassable. By this means the sides are made into gutters which catch the water and it soaks through the whole road-bed; the result is that the gravel soon disappears and the road is little better than at first. If gravel roads were made on well drained and compact foundations, with the gravel laid in layers, watered and well rolled, they would answer the purpose required of them where the travel is not very great.

The metalled part of a gravelled road should not be less than 8 feet wide. In some parts of the province it is very difficult to get either stone or gravel. In such cases a good substitute for the bottom courses can be made of well burned clay placed on the road in a similar manner. It will not answer so well for the top course, which should be of a hard, well wearing material, either broken stone or gravel, but a road wholly constructed of hard burned clay, on a properly prepared foundation is undoubtedly superior to a mud road, and can be built at a reasonable expense.

Earth Roads. A very large proportion of our country roads come under this designation. It is quite unreasonable to urge that all roads should be made of either stone or gravel. Earth roads we have and will have for years to come. The question is, what can we do to make them better? Can they be improved? If so, in what manner? There is no doubt they can be very much improved. They should be drained, graded and rolled with as much care as described for other roads. The grades should be made as even as possible. The crown of the surface should be more than for a stone or gravel road, as they do not shed the water so readily. The roadway should not be more than 20 feet wide, in order to keep the surface as dry as possible. No sods or vegetable matter should be used on the roadbed. Sandy roads can be greatly improved by putting a small quantity of clay on them. It is quite impossible to keep a clay road in good condition during wet weather, but with proper care and attention they can be greatly improved. If they are properly drained, the use of a horse road-machine and roller in the spring as soon as they have dried up, taking care to scrape from the outsides to the centre, will place them in good condition for the summer months.

Repairs and Maintenance.

When a road is completed and open for traffic, it should not be left to itself, but should be carefully watched, and if it shows any signs of settling, giving way, or working into holes, it should be attended to at once, otherwise it will soon deteriorate. There is no doubt that a road properly built in every particular should wear evenly, but the great trouble is to get a perfectly uniform hardness of metal and every part of the work done with exactly the same care. If there is a weak spot in any part of the work it will soon show itself after the heavy travel gets upon it, and as soon as it does, it should immediately be repaired. Always, in repairing a depression or hole in a road, use as nearly as possible the same kind of material that was used for surfacing the road. Clean out any mud that may be in the part to be repaired, loosen the surface over which the repairs are to extend with a pick, in order to secure a bond with the old bed, and put just sufficient material on the place so that when rolled or properly pounded it will be even with the surface at each side. When the thickness of the bed becomes so reduced that it is necessary to have it remetalled, let it be done in

sections. Before putting on new material, the surface should be picked up a little to allow the new material to bind well into the old, then the new metal should be laid, spread, wetted and rolled in the same manner as described for building the road. Repairing material should be placed at intervals along the side of the road so as to be convenient for use when required. The following instructions were published by the Road Improvement Association of London, England, for the use of their roadmen; they are well worth repeating. They are intended to apply only to Macadam and Telford roads:

1. Never allow a hollow, a rut or a puddle to remain on a road, but fill it up at once with chips from the stone heap.

2. Always use chips for patching and for all repairs during the summer months.

3. Never put fresh stones on the road, if by cross picking and a thorough use of the rake the surface can be made smooth and kept at the proper strength and section.

4. Remember that the rake is the most useful tool in your collection and it should be kept close at hand the whole year round.

5. Do not spread large patches of stone over the whole width of the road, but coat the middle or horse track first, and when this has worn in, coat each of the sides in turn.

6. In moderately dry weather and on hard roads always pick up the old surface into ridges six inches apart, and remove all large and projecting stones before applying a new coating.

7. Never spread stones more than one stone deep, but add a second layer when the first has worn in, if one coat be not enough.

8. Never shoot stones on the road and crack them where they lie, or a smooth surface will be out of the question.

9. Never put a stone upon the road for repairing purposes that will not freely pass in every direction through a 2-inch ring, and remember that still smaller stones should be used for patching and for all slight repairs.

10. Recollect that hard stones should be broken to a finer gauge than soft, but that the 2-inch gauge is the largest that should be used under any circumstances, where no steam roller is employed.

11. Never be without your ring gauge; remember Macadam's advice that any stone you cannot put easily in your mouth should be broken smaller.

12. Use chips, if possible, for binding newly laid stones together, and remember that road sweepings, horse droppings, soils or grass, and other rubbish, when used for this purpose, will ruin the best road ever constructed.

13. Remember that water-worn or rounded stones should never be used upon steep gradients, or they will fail to bind together.

14. Never allow dust or mud to lie on the surface of the roads, for either of these will double the cost of maintenance.

15. Recollect that dust becomes mud at the first shower and that mud forms a wet blanket which will keep a road in a filthy condition for weeks at a time, instead of allowing it to dry in a few hours.

16. Remember that the middle of the road should always be a little higher than the sides, so that the rain may run into the side gutters at once.

17. Never allow the water tables, gutters and ditches to clog up, but keep them clear the whole year through.

18. Always be on your road in wet weather and at once fill up with "chips" any hollows or ruts where the rain may lie.

A perfectly good road should always present a firm, dry, smooth and compact surface, free from ruts, hollows or depressions. The surface should neither be too flat to allow water to stand on the road, nor too rounding to be inconvenient to the traffic. The surface should be so constructed that the water cannot penetrate it from above nor the water and dirt from below.

Improvement of Existing Roads.

There are in nearly every township in the province, roads upon which a considerable amount of money has been spent in the way of reducing grades and putting on gravel.

Such roads in summer time are generally in fairly good condition, but in fall, winter and spring they get badly cut up into ruts and holes, and it will be noticed that in the spring when the frost is coming out of the ground, they are in their worst condition; "they have been heaved by the frost" and in a great many places the wheels of the vehicles will cut through into the subsoil. Now the condition described is caused mainly by lack of proper drainage; when there is thorough drainage of the road-bed heaving by frost will not occur; if there is no water in the road-bed the frost has nothing to act upon and will do no damage. Another great cause of injury to roads of this description, indeed to all our roads, is that nearly all repairs are made to them in the early part of the year, and in the fall there is no money left with which to make repairs. The statute labor has been put in, grants for repairs have been exhausted, and, if it be a wet fall, the roads get into very bad condition. They get cut up into ruts and holes, fill with water and freeze, and probably remain in that condition until spring. Is it any wonder, then, with water underneath and holes and ruts full of water above, that some of our best roads become almost impassable in the spring, and remain so until they become dry enough to get a road machine or scraper of some kind to level them up. By the exercise of a little attention and good judgment and at a small expense, roads like the above could be radically changed for the better.

Before any more surface material is placed on such roads see that the side drains are opened so that no water will remain within two feet of the surface, and also that all subsoil water is removed. If centre drains are required, dig a ditch on each side of the gravelled surface and put in tile drains as before described, with cross drains into the side ditches every 200 or 300 feet. Have the road surface made sufficiently convex to shed the water rapidly to the side ditches, and clean off all the mud from the road surface. Money spent in this way will give good results. Money spent on the road without first doing this, will, to a large extent, be wasted.

If the road-bed requires a new coating of surface material after being properly drained and rounded up, it should be put on evenly with the best gravel obtainable and thoroughly rolled to a smooth hard surface. Annual repair of roads, or the repair of roads only once a year is wrong in principle. They should be repaired at all times whenever they show signs of giving away, and for that purpose a certain amount of material should always be kept on hand along the road side at convenient intervals to make repairs when required.

Tires.

The width of tires on vehicles has a great deal to do with the destruction of our roads. The great defect is, that for heavy loads the tires are too narrow. It has been proved by repeated and careful experiments that wheels with tires 2½ inches wide cause double the wear of wheels which have tires 4½ inches wide. The surface of the roadway is not able to bear the heavy load put upon it by narrow tires; the tire therefore cuts through the surface and forms deep ruts.

The following extract is taken from a report of experiments made by the Professor of Agriculture of Missouri to ascertain just what the difference is between the force required for pulling a load of given weight over different kinds of roads and to show the value of broad tires: "The wheel tires were respectively 1½ inches and 3 inches wide, and the trial was on a partially dried mud road. The load was in each case 3,695 p unds. The draught for the broad

tires was 371 pounds and for the narrow 441 pounds, and the broad tires cut the road less deeply than the narrow ones." In the care of our gravel or stone roads the good effect of broad tires would probably be even more noticeable than on mud roads, especially in the matter of keeping the road surface compact.

The width of tires on wheels should be properly proportioned to the weights they are designed to carry. Wide tires have a tendency to roll the road and keep it smooth at the same time; usually it does not require the same amount of force to haul a vehicle with wide tires as it does to haul one with narrow ones. Municipalities should consider the regulating of traffic in this regard.

Most of the European countries have laws regulating the width of tires on vehicles. In France the market wagons have tires from 3 to 10 inches in width, usually from 4 to 6 inches. Not only have they wide tires but in most of their four wheeled freight wagons the rear axle is 14 inches longer than the fore axle, so that the rear wheels run on a line about an inch outside of the line of the fore wheels; instead of being a road destroyer they are a veritable road maker.

The following width of tire to load may be recommended.

Load on each wheel.	Wagon without springs.	Wagon with springs.
500 lb. to 1,000 lb.	2½ inches.	1½ inches.
1,000 " 1,500 "	3 "	2 "
1,500 " 2,000 "	4 "	3 "
2,000 " 3,000 "	6 "	4 "

In order to encourage the use of wide tires in the State of Michigan they have a law granting a certain reduction in taxes to those who use wide tires.

Vehicles on springs are much easier on roads than vehicles without springs.

Wheels of large diameter do less damage to roads than smaller ones and cause less draught.

Road Machinery.

Machinery for road-making effects a great saving in the expense of making and repairing roads, besides doing the work in much shorter time. Every municipality should have a sufficient number of road machines or graders to assist in keeping their roads in a proper state of repair and to construct new roads when required. There are various kinds on the market, mostly made of steel, and if used properly will pay for themselves in one season. Each municipality should also have either a horse or steam roller. A good horse roller is preferred for general road work; it should weigh about three tons and be so constructed that it could be weighted to seven or eight tons by stones or pig iron. The advantages of a light roller are, that in rolling soft material it will not stick, or push the material in advance of the roller, and when the bed is rolled with the light roller and becomes hard and smooth, weight can be added to the roller to any desired extent. These rollers should be made so that the tongue could be reversed from one side of the roller to the other, thus preventing turning around at the end of the stretch. Such a roller as the above can be purchased for $200, and its value in making and maintaining roads cannot be estimated.

Another machine that is necessary for any municipality building stone roads is a stone crusher. Throughout the province, in almost every township, are found numbers of boulders, usually termed "hard heads." They nearly all consist of excellent material for making good roads if broken. They have generally no commercial value, and with the aid of a stone crusher could be utilized in improving our road system. If the stone has to be transported a distance from the quarry, then the crusher should be placed at a point along where the road is to be constructed. This will be found more convenient than hauling the crushed

stone a long distance. Besides the above, there are various other labor-saving machines which can be used to advantage when occasion requires, such as wheeled scrapers, dump scrapers, sweepers, etc., but the above mentioned machines should be in the possession of every municipality that desires to construct and repair its roads in an economical manner. The writer knows of municipalities that have recently purchased and operated road machines in the improvement of their roads, and the result has been a marked improvement in the state of their highways.

Road Sides.

A word for the road sides How often the following is to be seen along the sides of the roadways in the country: Stumps and stones taken from the adjoining fields and piled along the fence, brush from the orchards, weeds from the gardens, saw logs and wood piled up to be taken to market when convenient, and weeds of every description allowed to grow.

The farmer who prides himself on the neatness and cleanliness of his farm, has just reason to protest against the roadway being used as a dumping place for the refuse of the farm or a storage place for logs and wood, or as a place in which foul weeds may mature their seeds to his injury.

Every traveller using the roadway has a right to protest against its being defaced in this manner, as it destroys a great deal of the pleasure that would be experienced were it kept in a proper state. Nothing should be placed on the roadway that will mar the view. A well-kept farm does not appear to advantage beside a badly-kept roadway. There should be as much thought and care given to improving the appearance of our roads as a good surface.

The sides should be levelled and graded so that they will present a smooth and sightly appearance. Trees should be planted along the road sides, and the whole kept in a proper state of repair, and everything done to make its appearance as pleasing as possible. By doing this it will not only add to the greater pleasure to be derived in travelling, but will improve both the appearance and the value of the farms along the roadway.

TWENTY-FIFTH ANNUAL REPORT

OF THE

FRUIT GROWERS' ASSOCIATION

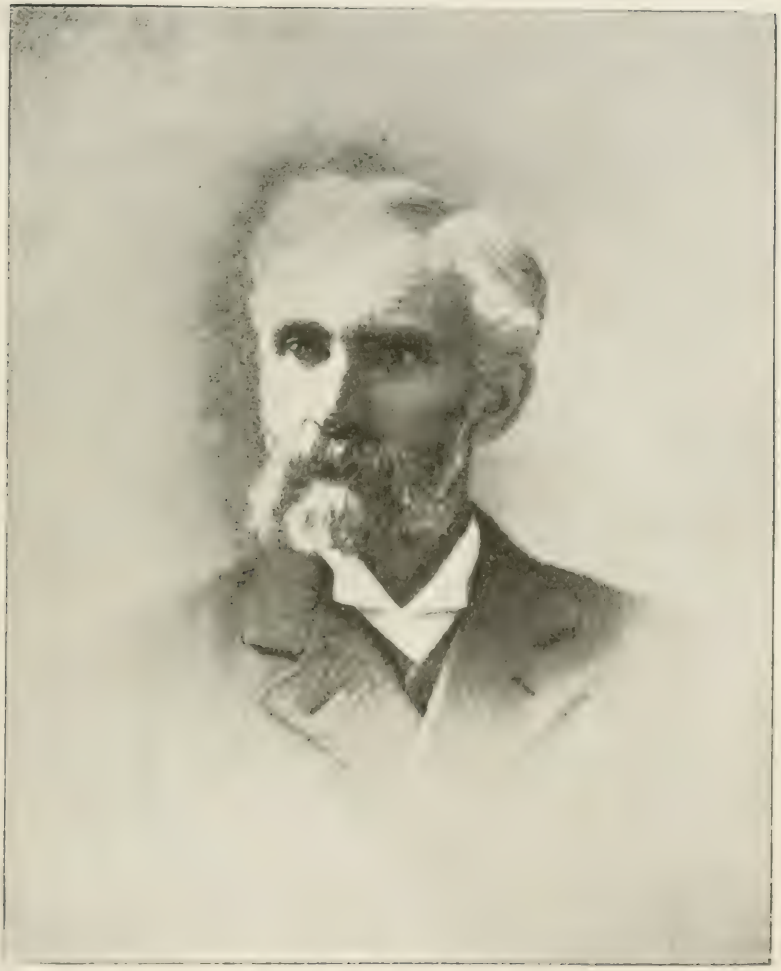
OF ONTARIO

1893.

(PUBLISHED BY THE ONTARIO DEPARTMENT OF AGRICULTURE, TORONTO.)

PRINTED BY ORDER OF THE LEGISLATIVE ASSEMBLY.

TORONTO
PRINTED BY WARWICK BROS & RUTTER, 68 AND 70 FRONT STREET WEST.
1894



T. H. RACE, Esq., Mitchell,

President of the Fruit Growers' Association of Ontario, 1894.

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ONTARIO'S VEGETABLE EXHIBIT AT THE WORLD'S FAIR, 1893.

ONTARIO'S FRUIT EXHIBIT AT THE WORLD'S FAIR, 1893.

ONTARIO'S FLORAL EXHIBIT AT THE WORLD'S FAIR, 1893.

TWENTY-FIFTH ANNUAL REPORT

OF THE

FRUIT GROWERS' ASSOCIATION OF ONTARIO.

To the Honorable John Dryden, Minister of Agriculture :

SIR,—In presenting to you this, our Twenty-Fifth Annual Report, I have the honor of calling your attention to the practical information contained in the discussions, which must tend to encourage the industry of fruit growing in central Ontario, where many of our best apples, such as Duchess, Blenheim, Wealthy, Pewaukee and others, seem to attain their greatest perfection ; also to the amendments made in the Pear Catalogue, which is intended as a guide for the use of judges at exhibitions.

Some references of general interest are also made to Canada's fruit exhibits at the World's Fair, Chicago, at which both the President and Secretary of this Association were honored with appointments, the one by the Province of Ontario, and the other by the Dominion of Canada.

I might further ask you to observe that, for the second time, we have enlarged the *Canadian Horticulturist*, until now it is a magazine of forty pages each monthly issue, and with a gradually increasing circulation.

I have the honor to be,

Sir,

Your obedient servant,

L. WOOLVERTON,

Grimsby, December, 1893. Secretary.

OFFICERS FOR 1894.

PRESIDENT:

T. H. Race ..... Mitchell.

VICE-PRESIDENT:

Murray Pettit ..... Winona.

SECRETARY-TREASURER AND EDITOR:

Linus Woolverton, M.A. ..... Grimsby.

DIRECTORS:

Division No. 1	W. S. Turner, Cornwall.
Division No. 2	R. B. Whyte, Ottawa.
Division No. 3	D. Nicol, Cataraqui.
Division No. 4	Wellington Boulter, Picton.
Division No. 5	Thos. Beall, Lindsay.
Division No. 6	W. E. Wellington, Toronto.
Division No. 7	W. M. Orr, Stony Creek.
Division No. 8	A. M. Smith, St. Catharines.
Division No. 9	J. R. Howell, Brantford.
Division No. 10	J. A. Morton, Wingham.
Division No. 11	J. D. Stewart, Russeldale.
Division No. 12	Alexander McNeill, Windsor.
Division No. 13	G. C. Caston, Craighurst.

AUDITORS:

A. H. Pettit ..... Grimsby.
W. W. Hillborn ..... Leamington.

COMMITTEES:

New Fruits. Messrs. A. McD. Allan, D. W. Beadle and John Craig.
Revision of Assessment. Messrs. D. W. Beadle, W. E. Wellington and A. McD. Allan.
Experimental Work. Messrs. Alex. McNeill, John Craig and W. W. Hillborn.
Finance. Messrs. A. M. Smith, W. M. Orr and M. Pettit
Executive. The President, Vice-President and Secretary.

COMMITTEES REPORTING AT THE MEETING:

Fruit Exhibit. Prof. Craig, Messrs. E. B. Edwards and Geo. Cline.

Nomination. By the Chair—Messrs. Alex. McNeill and T. M. Grover. By the Association—Messrs. W. S. Turner, M. Pettit and D W. Beadle.

Legislation. Messrs. A. H. Pettit, Alex. McNeill, D. W. Beadle, E. B. Edwards and W. Boulter.

N.B.—The President, Vice-President and Secretary are *ex officio* members of all committees.

REPRESENTATIVES:

Western Fair. Messrs. T. H. Race and W. W. Hillborn.
Central Fair. Messrs. R. B. Whyte and John Craig.
Industrial Fair. Messrs. W. E. Wellington and A. H. Pettit.
Central Farmers' Institute. Mr. Murray Pettit.

DELEGATES:

Experimental Union. Mr. W. M. Orr.
Western New York Horticultural Society. Mr. John Craig.
Michigan Horticultural Society. Mr. Alex McNeill.

The next Winter Meeting will be held in the Town of Orillia.

CONSTITUTION AND BY-LAWS OF THE ASSOCIATION.

CONSTITUTION.

Art. I. This Association shall be called "The Fruit Growers' Association of Ontario."

Art. II. Its object shall be the advancement of the science and art of fruit culture by holding meetings for the exhibition of fruit and for the discussion of all questions relative to fruit culture, by collecting, arranging and disseminating useful information, and by such other means as may from time to time seem advisable.

Art. III. The annual meeting of the Association shall be held at such time and place as shall be designated by the Association.

Art. IV. The officers of the Association shall be composed of a President, Vice-President, a Secretary, or Secretary-Treasurer, and thirteen Directors.

Art. V. Any person may become a member by an annual payment of one dollar, and a payment of ten dollars shall constitute a member for life.

Art. VI. This Constitution may be amended by a vote of the majority of the members present at any regular meeting, notice of the proposed amendments having been given at the previous meeting.

Art. VII. The said Officers and Directors shall prepare and present at the annual meeting of the Association, a report of their proceedings during the year, in which shall be stated the names of all the members of the Association, the places of meeting during the year, and such information as the Association shall have been able to obtain on the subject of fruit culture in the Province during the year. There shall also be presented at the said annual meeting a detailed statement of the receipts and disbursements of the Association during the year, which report and statement shall be entered in the journal and signed by the President as being a correct copy; and a true copy thereof, certified by the Secretary for the time being, shall be sent to the Minister of Agriculture within forty days after the holding of such annual meeting.

Art. VIII. The Association shall have power to make, alter and amend By-laws for prescribing the mode of admission of new members, the election of officers, and otherwise regulating the administration of its affairs and property.

BY-LAWS.

1. The President, Vice President and Secretary-Treasurer shall be *ex officio* members of all committees.

2. The Directors may offer premiums to any person originating or introducing any new fruit adapted to the climate of the Province which shall possess such distinctive excellence as shall, in their opinion, render the same of special value; also for essays upon such subjects connected with fruit growing as they may designate, under such rules and regulations as they may prescribe.

3. The Secretary shall prepare an annual report containing the minutes of the proceedings of meetings during the year; a detailed statement of receipts and expenditure, the reports upon fruits received from different localities, and all essays to which prizes have been awarded, and such other information in regard to fruit culture as may have been received during the year, and submit the same to the Directors or any Committee of Directors appointed for this purpose, and, with their sanction, after presenting the same at the annual meeting, cause the same to be printed by and through the Publication Committee, and send a copy thereof to each member of the Association and to the Minister of Agriculture.

4. Seven Directors shall constitute a quorum, and if at any meeting of Directors there shall not be a quorum, the members present may adjourn the meeting from time to time until a quorum shall be obtained.

5. The annual subscription shall be due in advance at the annual meeting.

6. The President (or in case of his disability, the Vice-President), may convene special meetings at such times and places as he may deem advisable; and he shall convene such special meetings as shall be requested in writing by five members.

7. The President may deliver an address on some subject relating to the objects of the Association.

8. The Treasurer shall receive all moneys belonging to the Association, keep a correct account thereof and submit the same to the Directors at any legal meeting of such Directors, five days' notice having been previously given for that purpose.

9. The Directors shall audit and pass all accounts, which, when approved of by the President's signature, shall be submitted to and paid by the Treasurer.

10. It shall be the duty of the Secretary to keep a correct record of the proceedings of the Association, conduct the correspondence, give not less than ten days' notice of all meetings to the members, and specify the business of special meetings.

11. The Directors, touching the conduct of the Association, shall at all times have absolute power and control of the funds and property of the Association, subject however to the meaning and construction of the Constitution.

12. At special meetings no business shall be transacted except that stated in the Secretary's circular.

13. The order of business shall be: (1) Reading of the minutes; (2) Reading of the Director's Report; 3) Reading of the Treasurer's Report; (4) Reading of the prize essays; (5) President's Address; (6) Election of officers, and (7) Miscellaneous business.

14. These By-laws may be amended at any general meeting by a vote of two-thirds of the members present.

15. Each member of the Fruit Committee shall be charged with the duty of accumulating information touching the state of the fruit crop, the introduction of new varieties, the market value of fruits in his particular section of the country, together with such other general and useful information touching fruit interests as may be desirable, and report in writing to the Secretary of the Association on or before the fifteenth day of September in each year.

The President, Vice-President and Secretary shall be *ex-officio* members of the Board of Directors and of all Committees. The reasonable and necessary expenses of Directors and officers in attending meetings of the Board of Directors and of Committees shall be provided from the funds of the Association.

Local Fruit Growers' Association.

16. It shall be the duty of the officers and directors of the Fruit Growers' Association of Ontario to encourage the formation of local fruit growers' horticultural societies in affiliation with the Ontario Association.

17. Any one may become a member of such local society for one year upon payment into its treasury of a minimum sum of one dollar; and a compliance with clause 18 of these by-laws shall constitute him also a member of the Ontario Association for the same term.

18. On the receipt of the names of such members, with the required fees, the secretary of such local affiliated society may transmit their names and post office addresses, together with the sum of eighty cents for each to the Secretary of the Fruit Growers' Association of Ontario, who will enter their names as members of that society, entitled to all its privileges, providing the initial number of such names be not less than ten.

19. Each local society so affiliating, with a membership of not less than twenty-five, shall be entitled to a visit from some member of the board of directors or other prominent horticulturist, once a year, at their own request; it being understood that the railway expenses of such speaker shall be paid by the Ontario Society, and the entertainment provided by the local society.

20. The proceedings of such local fruit growers' horticultural societies shall, on or before the 1st day of December of each year, be forwarded to the secretary of the Ontario Society, who may cull out such portions for the Annual Report to the Minister of Agriculture for the province, as may seem to him of general interest and value.

21. These local societies, if formed in cities, towns or incorporated villages, may be formed under the Agriculture and Arts Act (see sections 37, 46 and 47) and receive their due share of the Electoral District grant for the support of such societies.

22. Each local affiliated society is further expected to send at least one delegate to the annual meeting of the Fruit Growers' Association.

The director of the Fruit Growers' Association of Ontario of the Agricuctural District in which such society is formed, shall be *ex-officio*, a member of the executive committee of such local society and receive notices of all its meetings.

AGRICULTURAL DIVISIONS.

1. Stormont, Dundas, Glengarry Prescott and Cornwall.

2. Lanark North, Lanark South, Renfrew North, Renfrew South, Carleton, Russell and the City of Ottawa.

3. Frontenac, City of Kingston, Leeds and Grenville North, Leeds South, Grenville South, and Brockville.

4. Hastings East, Hastings North, Hastings West, Addington, Lennox and Prince Edward.

5. Durham East, Durham West, Northumberland East, Northumberland West, Peterborough East, Peterborough West, Victoria North (including Haliburton), and Victoria South.

6. York East, York North, York West, Ontario North, Ontario South, Peel, Cardwell and City of Toronto.

7. Wellington Centre, Wellington South, Wellington West, Waterloo North, Waterloo South, Wentworth North, Wentworth South, Dufferin, Halton and City of Hamilton.

8. Lincoln, Niagara, Welland, Haldimand and Monck.

9. Elgin East, Elgin West, Brant North, Brant South, Oxford North, Oxford South, Norfolk North, and Norfolk South.

10. Huron East, Huron South, Huron West, Bruce Centre, Bruce North, Bruce South, Grey East, Grey North and Grey South.

11. Perth North, Perth South, Middlesex East, Middlesex North, Middlesex West and City of London.

12. Essex North, Essex South, Kent East, Kent West, Lambton East and Lambton West.

13. Algoma East, Algoma West, Simcoe East, Simcoe South, Simcoe West, Muskoka and Parry Sound

THE ANNUAL MEETING, 1893.

The Annual Meeting of the Fruit Growers' Association of Ontario, opened at one o'clock on Tuesday, December 5th, in the Town Hall, Peterborough, the President, Mr. A. H. Pettit, in the chair.

THE PRESIDENT'S ADDRESS.

By A. H. Pettit, Grimsby.

Mr. Chairman,—Again I am called as your President to present the annual address on this the thirty-fourth annual session of this Association. This address should, perhaps, contain a recapitulation of the work of the past season, and, like a mile post on the highway, mark the progress we have made, and point out, if possible, the most practical route on which to continue our journey.

When we consider that this Association first entered on the work in which we are now engaged, with little practical experience to guide it, its champions but apprentices in the field with no works of science on that subject written by skilled horticulturists, in a land of almost unknown possibilities, having no financial resources, save self-sacrifice on their part to stimulate and foster this great industry, truly, sir, we may congratulate ourselves on the success that has attended its efforts.

Where do we find ourselves to day? laboring in a field cleared of all those obstacles with the best practice of skilled horticulturists in every part of our land set before us, with orchards and vineyards like the mile posts of old to guide the student and encourage the laborer in his work: that great cable that stretches from shore to shore, across the mighty deep, flashing to us the requirements of their people, and very often, as it were, closing a deal that means thousands to the resources of our people; with the mighty power of steam and electricity, like the veins in the human body, coursing throughout the length and breadth of our land and into every nook and corner thereof, in order to draw all countries in closer commercial harmony and accord. Surely under such circumstances our work is plain and our responsibility great, if we fail to foster, guide and direct that ever-increasing stream of fruit products into the most profitable channel. Are there not fields to-day, like our boundless prairie, rich and fertile, that yield us no return, for the lack of cultivation? These should be reached, if not with fresh fruit, then in its manufactured state, and we might direct our attention in that line with advantage to the producer of fruit.

I might point out one of our products that has made most marvelious strides in that direction, through the instrumentality of Associations like this, coupled with the uniform good quality of the article itself. I refer to the cheese industry. Is the fruit industry less important to the welfare of our country, and should it not claim at our hands a larger share of attention in the direction of finding wider markets? The butter

industry to-day is being fostered by the Government, and will, no doubt, in time rival the cheese export, and why cannot we, the fruit producers of our country, claim some share in that policy, carried on by the Government of our country, towards opening up new markets and making known their good quality? While the Government is framing its policy in the interests of the people, and thus fully recognize the importance of the agricultural and horticultural interests in our land, might we not ask them to place, not one big specimen, as they are doing in cheese, but one reasonably large consignment in some of those markets that as yet have not been cultivated in order that the size, color and quality of fruit might win for us a wider market?

I referred, last year, to my work in connection with the Ontario Fruit Exhibit for the World's Fair, giving a short description of the initiatory work then completed; I desire now to briefly refer to the continuation of that work and the final result as described by the judges at the close of their labors.

On the 25th day of March last, I issued a circular to the Fruit Growers of Ontario through the channel of our Farmers' Institutes and Fruit Growers' Associations, urging them to take some united action in their separate localities, whereby their fruits might be fairly represented at the World's Fair, pointing out what seemed to me to be the most simple and at the same time most economical and effective plan I could suggest. In answer to this appeal I received a large number of very encouraging replies. I then had some two hundred cases made of convenient size for shipping fresh fruits in their best condition; these were forwarded to those points where action was being taken; they were filled with packing material and also a circular of instruction, how to pack and ship, together with forms of invoice, address cards, etc. These were returned again from time to time and served a very good purpose. I also pointed out in this circular that the quantity need not be so large, but the quality and regularity of shipments most important. I can now, as the representative of the fruit interests of Ontario on that occasion, tender my most hearty thanks to those who so nobly and patriotically, with the choicest fruits of their locality, assisted me to carry the horticultural banner of our province to such a successful issue, and that at perhaps the greatest exhibition of fruit the world has ever seen brought together.

I think, sir, it will be readily conceded that Ontario had the largest exhibit of fruit, scored the largest number of points, rated the highest as to quality, of any exhibit on the grounds; and in order to make room for our display several States generously contributed a portion of their space. Washington Territory allowed us some forty feet along the centre passage; South Dakota, twelve feet, and the North-west Territories some thirty feet, all of which was filled to repletion by the generous contributions of the fruit growers of Ontario.

I would like very much to give in detail a description of the various exhibits made, covering the whole of this North American continent, and showing wherein our country possesses superior advantages to many; this I shall try to do at a later period, as time will not permit me to do so now.

I wish now to call your attention to the wide range of varieties embraced not only in our fruits in solution, but in fresh fruits collected from nearly every part of our province, and to the prompt realization of the object we sought to attain, calling

forth very frequent and satisfactory remarks, such as this: "I am astonished at the wide range of fruits your country is capable of producing. It is a revelation to me." Was not this the great object we sought to attain? I am satisfied that thousands of visitors to that great exposition have received a wider knowledge of the resources, capabilities, and climatic influences of our country, that no other method could have so readily accomplished.

Another point I wish to make clear on this occasion. Some of the papers in this province gave a very confused statement of the awards secured by Ontario in the fruit department. I wish now to give a correct one, copied from the official report of the board of judges.

Provincial Awards were made to the Province of Ontario on:

1 Fruits in solution.
2 Apples of 1892.
3 Apples of 1893.
4 Pears and Quinces.
5 Stone fruits.
6 Cherries in variety.
7 Currants.
8 Display of native and foreign Gooseberries.
9 Continuous display of Blackberries.
10 Grapes.

In all ten Provincial Awards. Now these fruits, although entered for a Provincial Award, were also entered in the producer's name, in order that each individual might receive, and each locality as well, all the credit attaching to his or their contributions towards the provincial display, and for another reason which I wish to explain, in order that later on in the season I might claim for those districts that contributed so much towards the desired result, some recognition for their labors, and on that score we received the following District Awards:

Niagara District	Grapes.	Niagara District	Pears and Peaches.
Burlington "	Grapes.	Essex "	Apples.
Wentworth "	Grapes.	Belleville and Eastern District	Apples.
Wentworth "	Apples and Peaches.	Grey "	Apples.
Wentworth "	Pears.	Huron "	Apples.
Burlington "	Apples.	Simcoe "	Apples and Pears.
Burlington "	Pears.		
Niagara "	Apples.		

In all fourteen District Awards. Then on that score the judges felt there were also individuals who had contributed largely towards the display, and some recognition was due them in like manner, with the result that eleven Individual Awards were made as follows:

James Sheppard & Son	Queenston	Peaches.
W. R. Read	Port Dalhousie	"
C. Atkins	Stony Creek	"
W. Kottmeier	St. Catharines	"
Edward Tyhurst	Leamington	"
Geo. W. Cline	Welland	Plums.
William Stewart	Goderich	"
W. Warnock	Clarkson	"
Richard Trotter	Owen Sound	"
W. M. Orr	Stony Creek	"
Murray Pettit	Wilcox	Grapes.

This record for Ontario will speak for itself not in this country alone, but in a far wider field. It was written by men who came from some of the finest fruit growing States in the Union, and men possessing a wide knowledge of the science of Pomology; their labors were arduous, indeed, and Ontario added no small portion to their labors; and in the discharge of that duty I believe they were guided by but one true principle, to deal out fair and even handed justice to all, "let the chips fall where they may."

I cannot at this time, at the close of an eventful struggle for Ontario's supremacy in the horticultural field, but express my most unbounded satisfaction, with the hearty and unanimous manner in which my every effort in that direction has been supported, first to the Ontario Commissioner, Mr. Nicholas Awrey, for his wise and willing counsel at all times freely given to the Fruit Growers of Ontario, who so promptly and generously contributed to the desired object ; to Chief J. M. Samuels, of the Horticultural Department, for his kindness and courtesy at all times; to the express companies and customs officials who used every effort to have our goods promptly delivered ; to Mr. W. M. Orr, whose interesting efforts and happy manner rendered good service in the cause, and to Mr. James Brodie, who during the past two seasons has rendered valuable assistance in the work.

A WELCOME.

Mr. E. B. Edwards, of Peterborough, welcomed the Association. He said : We have done what we could to get the farmers here, and I expect to see them gathering in. I have much pleasure in introducing Mr. Anderson, the Warden of our County, who has come in to show the interest that he takes in the Association, and I will ask him to express a word of welcome to the Association.

Mr. W. Anderson welcomed the Association, and hoped that their visit would be a benefit to the locality. For himself, he had come to listen and to learn, and he expected personally to profit by the discussions.

Mr. D. W. Dumble, Police Magistrate, said : There is no part of the country that needs the presence of this Association more than the County of Peterborough. My enthusiastic friend, Mr. Edwards, says there are any amount of latent capabilities here. They have not been developed to the extent that I think is possible, and I incline to think that the reason has been that the varieties grown here have not been suited, and those that were suitable have been too widely scattered to make a marketable commodity. Our people, in order to make fruit growing profitable, want just such instructions as you are going to give ; and I am sure your meeting will be successful in every way. We shall be glad to get all the information we can.

The President : We all appreciate the words of welcome extended to this Association. Last year, when we decided to come to Peterborough to hold this meeting, we felt that we were coming to one of the finest sections in the province of Ontario. We knew it was a wonderful cheese-producing, and to a certain extent fruit-producing section ; and we expect by coming here to gain from you, gentlemen, and the farmers and fruit-growers of this section of the country, a great deal of information. We also expect, having present, as you will see around this room, representative fruit men from almost every part of our province, to be able possibly to give a little information. Of course if we are not receiving information and gaining every day we must be going back ; therefore we expect to get information, and hope to be able to impart it. I do not know very much of the extent of the fruit interest in this section, but I have no doubt, from the appearance of the country, that there is room for a great advancement in that respect. In some branches of agriculture—in wheat growing, for instance—we seem to be producing almost more than the requirements of the people. Possibly we might increase our fruit production and decrease our wheat production with advantage to all concerned. We would be glad to see you all members of our Association ; but whether members or not, we want you to take an active part in the discussion, and assist in advancing that great interest we are endeavoring to promote in every possible way. I may add that those becoming members receive the *Horticulturist* through the year, and also get the annual report as well as share in the distribution of plants and shrubs, and different kinds of new things coming in. Mr. James, Deputy Minister of Agriculture, is present, and he is preparing some statistics of fruits produced in our country. I will now call upon him to address you.

FRUIT STATISTICS.

Mr. JAMES, Deputy Minister of Agriculture, said: As most of you, I presume, are aware, the Department of Agriculture for the Province gathers every year statistics in connection with the production of the staple field crops, statistics in regard to our live stock and other information dealing with agriculture. It is not a matter of very great difficulty to obtain, for instance, the acreage of fall wheat in Ontario. We can get that from the farmers, and we can also get it directly from the assessors' returns. Having that to start with, all that we have to do is to send out our thousands of circulars to the farmers all over the province during the summer and at the end of the season, in order to obtain the yields per acre. In that way we are able to find out pretty closely how many bushels of wheat and other grains are produced in this Province. But that is only a part of the farm work of this country. Then we have been accustomed for the last ten years to gather statistics in regard to the cheese industry of Ontario. We have found, for instance, that we have been making enormous strides in that direction, until now our annual product is coming pretty well up to 100,000,000 pounds. There is another field that, as I said, has not been touched upon, viz., that of the orchard, garden and vineyard; but there are so many difficulties right at the outset that we are almost afraid to undertake it. Wheat is wheat; and no matter what the varieties may be, all go in together, are mixed in our elevators together, and are sold together. When we come to apples there are so many varieties, and the difference in bearing is so great, that the difficulties seem to be insurmountable. However, for two years, acting partly in concert with this Association, we have been endeavoring to gather statistics; and I think now we have the foundation laid to gather information that will be as reliable in regard to our fruits as the information that we have in regard to our grains. Some may say, perhaps, that the fruit growing of Ontario is not nearly as important as grain growing, or as the production of dairy articles. A man has a little orchard; he has a few trees, a few vines; and probably very few out of the entire number of farmers send their produce to market. Now, let us see as to whether the fruit-growing industry of Ontario is of such little consequence as some are apt to believe. From our two years' work we have come to what we consider pretty reliable information in regard to the number of the various fruit trees—*i. e.* fruit of the larger sorts—that we have grown here in Ontario. In round figures they are about as follows—of course this does not take in the small orchards of towns and villages; our work so far deals only with farm lands and the large fruit growers, so that the number may have to be slightly increased although not to any great extent. Thus, for instance, in apples we find there are about 7,000,000 bearing apple-trees in Ontario; about 2,000,000 bearing grape vines; 700,000 plums, 500,000 each of cherries, pears and peaches. Now, if you will take the average crop for each of those, and put a moderate rate as the value of the product, you will find that the figures thus obtained will amount up to a considerable sum. Of course only a portion of the fruit goes to market; nevertheless it is the produce of the farms, orchards and gardens of this country, and though it may not find its way to market, it finds its way to the tables of this country, and the farmer himself perhaps consumes the larger portion of it. I have put the figures in that rounded off form in order that we may carry them away. I presume there is no great necessity to go into minute details. We find that whereas some of the different fruits are confined to different localities, some of these, such as apple growing, is found in all parts of the Province. The second point I want to refer to this, that, taking our figures of this year and comparing them with last, we find a slight increase in regard to all those fruits over last year, showing that the number of pear trees, peaches, plums, cherries and grape vines—is slightly increasing year after year; and just as in the case of the cheese production of Ontario, we have not yet come to the limit of our production. I suppose the limit will be set by the demands of our home and foreign markets. The only two points, then, that I want to make here are these: First, that fruit growing has already assumed very large proportions here in Ontario—much larger proportions than we are at first disposed to think; and second, that there is a steady increase; there is also a gradual and quite a perceptible improvement in the nature of our fruit growing and in the quality of the fruit which is being produced. (Applause.)

Mr. D. W. DUMBLE (Peterborough): Just for information, and that we may have a more definite conception of that, I would ask: How do you get at the returns?

Mr. JAMES: I suppose that would necessitate in the first place explaining how the government obtains its figures in regard to many of those crops.

Mr. DUMBLE: This figure is so astounding to us that actually I am incredulous; and I want to know your basis.

Mr. JAMES: In the first place, we must find how many producing trees there are in Ontario. Take apples, for instance. There are two ways of getting at a thing of that kind. One is to go to every man over the entire Province and ask him how many apple trees he has on his farm. That is done in the taking of a census—done every ten years in the Province of Ontario. In getting these returns from year to year, however, we have assessors' returns as to the acreage of our orchard and garden. Unfortunately these returns are not definite enough for us to base our reports upon. Every spring the Department of Agriculture sends out—one time we sent out 110,000 or 115,000 cards—to the the farmers in the Province. Sometimes we get these names from voters' lists, and we keep checking them over so that we know that the lists are simply and solely farmers. Last year we got the names from the public school teachers. We got the address of every public school teacher in the Province. To that public school teacher we sent asking for the name of the farmers in his school section. These names came back. Then we knew we had at first hand the names of the farmers in each school section of the Province. Putting these together, they ran up into thousands and thousands. Then to these farmers we sent out blank forms asking them as to the number of acres in their farm, the number of acres in pasture, the number of acres in wheat, and so on; the amount of stock; value of their farm; value of their implements; and also in the last two years we have asked them the number of plum trees, pear trees, peach trees, grape vines, and so on and from these we have taken our returns. We have not the time or the staff to do that every year; but when we get the total acreage of a township, and returns from as large a proportion of that as possible, from that we have to make an estimate. We may be a little too high in some cases, a little too low in others; but these will offset one another, taking the Province as a whole, and from that we get our returns. At the end of the season we send a card asking for a return per tree of the various fruits; then it is a matter of calculation—of suming up. For instance, last year the hay crop was valued at $36,000,000. That is a crop that every one knows is large; but the point that I made was that fruit is so neglected by the ordinary farmer that he does not consider it of very much value, but when you come to put it together it amounts to a large sum.

Mr. EDWARDS: Then you consider these figures you have given us are fairly reliable?

Mr. JAMES: I think I have under-estimated rather than over-estimated.

The PRESIDENT: Gentlemen, this is an important subject, and we have a gentleman here who has been operating in that direction for two or three years. We will be glad to have any question. I may say that in addition to the regular programme of subjects we have questions. Any question that is called for we will be glad to bring it up; also if any gentleman wishes to put any question, the Secretary is always ready to receive it and have it brought forward at any time. We might take up the third question on the paper, and I would ask Mr. Smith to open the discussion on it.

THE MOST PROFITABLE APPLE.

Q. What one variety of summer, fall and winter apples has paid most profit in the commercial orchards of Ontario, during the past ten years?

Mr. A. M. SMITH (St. Catharines): I can only speak from the standard of the Niagara District, and in beginning I would say that no variety of apple has been very profitable there for the last three years. Our apple crop has been almost a failure.

Mr. JAMES: You say it has been "almost a failure." Now, we get that reply in our returns to questions—"apple crop a failure;" "almost a failure." What do the farmers mean when they say it is almost a failure? What do you mean when you say it is almost a failure? We find when we get their figures afterwards that there was quite a considerable crop.

Mr. SMITH: I mean that many of our farmers have to buy their own apples, and very few of them have any to sell. Some orchards are totally unproductive. A few have perhaps some varieties that are bearing well, and occasionally one in some sheltered or favored locality may be fairly productive. The one variety of summer apple that has been most profitable and productive has been probably the Duchess of Oldenburg. For fall, the Colvert, I think, perhaps, though it is grown to a very limited extent. The Blenheim Pippin has done fairly well also.

Mr. EDWARDS: Do you call that a fall variety?

Mr. SMITH: In our section.

Mr. CASTON (Craighurst): Isn't that a winter variety? I saw it in Oxford County last January and it was in splendid shape, and it would keep a couple of months longer.

Mr. SMITH: I suppose you would call the Snow apple a winter apple?

Mr. EDWARDS: It keeps till January; but the Blenheim is decidedly more of a winter apple than the Snow apple is with us.

Mr. SMITH: I don't think it will keep any longer.

Mr. EDWARDS: We keep them here till May.

The SECRETARY: Under what conditions?

Mr. EDWARDS: Ordinary conditions—in cellar. I count on having a dish of Blenheims every Sunday morning during winter up till May.

Mr. SMITH: I count on having grapes up till May, too.

Mr. EDWARDS: They are kept without any special care; their temperature kept fairly low, but without any special care to regulate it by means of a thermometer or anything of that sort—an ordinary cellar.

The SECRETARY: 35° to 40°?

Mr. EDWARDS: Yes.

Mr. SMITH: Probably the most productive and profitable winter apple in our section is the Baldwin, though that has failed for one or two years. This year the Rhode Island Greening has given better results than any other winter apple I know of.

The PRESIDENT: Now, Mr. Caston, we will call upon you next, for the north.

Mr. CASTON (Simcoe County): For an early apple I would agree with what Mr. Smith said about the Duchess of Oldenburg. Then for fall, either the Alexander or the St. Lawrence—I would say the latter. It is sometimes liable to scab, but is a splendid apple, and one that bears well. Then as to winter apples, I would say the Snow. I think you will find on our list prepared by a committee of this Association that it is a winter apple; and I think among the early winter apples the Snow has been the most saleable in our locality—in fact it has been one of the most valuable apples we have had. Some years it is pretty badly threatened with the scab, but it is always in good demand, and I don't know that there is any winter apple that pays better in our section than the Snow in the past ten years. Then the later winter apple would be a choice between the Spy and the Russet. The Spy is a long time coming into bearing in our section, but it brings the most money, and I think it would be difficult to choose between the Spy and the Russet which is most profitable. Of course in future the Pewaukee may prove to be most profitable.

Mr. BOULTER (Picton): Has the Snow ever been a success in exporting to Great Britain?

Mr. CASTON: There have not been a great many sent to the Old Country from our section; we ship more of the later varieties; but for the markets nearer us, round the north part of the Province, where they do not grow many apples, there is nothing sells better than the Snow. Everybody wants a few barrels of them any way.

Mr. EDWARDS (Peterborough): I think the Northern Spy is the apple which is most commonly grown here as a winter apple, and is found to be very successful in this locality, growing a good size and good color and quality. The Blenheim Orange I have found in my own experience a very good winter apple, and it would keep fairly well into the late part of the winter.

Mr. CASTON: Is it not a shy bearer?

Mr. EDWARDS: No; we find it a very fair bearer—fairly regular and fairly good crops. For fall apple the St. Lawrence goes very well in this neighborhood; and for the earlier season the Duchess, I think, is usually the best, and in this locality it grows very well and seems to have a very good flavor and is very finely colored. As fair as profit is concerned, I should put the Blenheim Orange, from my experience, above all as the most valuable.

The PRESIDENT: Now, you notice in the circulars just distributed, that the list is revised for the various districts. We would like to get your views as to which are the most valuable sorts for the various districts.

Mr. GILES (Peterborough): I find that the Pewaukee is a very good apple, but it has one very bad fault—it falls off the tree very much. I don't know whether the trouble is with my land, or what it is. If it would not fall off, it would take the place of the Northern Spy. The Spy holds first place, but I think the Pewaukee is just as good as it, barring that fault.

The PRESIDENT: Does it fall before it is ripe?

Mr. GILES: Yes.

Mr. BOULTER (Picton): I have read this list over and have been surprised at some of the varieties that have been classed as first-class and desirable to be cultivated. The mistake of most apple-growers to-day is in planting too many varieties. You must select according to climatic conditions. My friend young Mr. Dempsey told me yesterday that he had realized more money from his Snows this year, per tree, than any other apple that he produced. I have been favorably impressed this year with the Snow as a commercial apple; but hitherto they were so scabby that I had to throw away quite a few that I had bought for my factory. As to value of winter apple, my buyer this fall had more enquiries for Northern Spy and Baldwin than any other varieties grown in Prince Edward County; and they would bring more money per barrel. He had orders for Spies to go to Prince Edward Island. I don't know why the Spy has not been classed as one of our first-class shipping varieties. I have seen it printed that no gentleman would place the Northern Spy on his table as one of the first apples grown in Ontario. I think to the contrary. Properly cultivated where the sun can get at it, we can grow as fine Northern Spys as can be grown anywhere; and American friends who have been visiting me say they have never tasted any apple grown anywhere in the States that can come up to the flavor of the Northern Spy. The Duchess is a first-class apple. The Colvert I think very little of; it is a tasteless apple, though nice to handle. If we use Colverts we have to buy Jenettings to flavor them with.

The SECRETARY: What would you leave off from that list for No. 4 if you wished the Spy included, and we will have it changed?

Mr. BOULTER: The Ben. Davis is really a good apple; I believe it is as good an apple as we can grow, knowing what I do of the English market.

Mr. CASTON: Its principal market value is not its quality, but the good shape in which it gets there?

Mr. BOULTER: It is a beautiful, bright apple; and has good keeping qualities. Along in March the Ben Davis is very good. This is the first year that I have not had a good crop of them. The Pewaukee has not been widely cultivated in Prince Edward County yet. To-day I have no more healthy apple trees than the Spies and Baldwins and Golden Russets.

The PRESIDENT: What varieties do you prefer for canning?

Mr. BOULTER: For summer apples we want the Duchess of Oldenburg first. If we could not get any other we would take it the second time and the third time. We like the St. Lawrence, andwe like the Fall Jenetting, although it is a very rough, hard apple to peel. These are three good varieties that cannot possibly be beaten in the way of canning apples. Let me tell you, whatever taste an apple has, when it is peeled and put into the can, it will come out and taste just the same six months or six years after. Consequently if you put an apple that is tasteless, your canned fruit will have no taste. There is too much water in the Colvert and in the Snow. I have done my best to make a success of the Snow as a canning apple, and I cannot do it: it is too soft and watery. There is no apple that cans better than the Northern Spy.

Mr. J. McK. SMITH (Peterborough): What about the Ben Davis?

Mr. BOULTER: The Ben Davis is a good apple, but it takes about a year to get it ready.

Mr. MCNEIL (Windsor): One gentleman at the Windsor meeting attempted to say that the Ben Davis was the most profitable apple that he grew, and the Convention almost laughed him down. I sent him some enquiries in connection with this meeting, and he said, "By all means give the Ben Davis a good word; it is the best apple I have yet" Last January he sent me some Ben Davis apples. I tell you they are just as nice an apple as I want to eat—and I am very particular about apples, too The Ben Davis is like a piece of cork, as you might say, in the fall and winter, but coming along in January I give them to the children, and they take them willingly when the better class of apples would be refused. Either your Ben Davis isn't ours, or else your taste is perverted. As for profit, I believe there is no apple grown that will give you as much. For a winter apple why not plant it more largely? It appears to me there is a feeling in the Association that we should not not plant it; and the feeling comes not from those who really have it but from those who are struggling after higher things in fruit. Now, let us have the higher things, but let us have a little money element in it. (Hear, hear) I believe for the money element the Ben Davis is ahead of them all. I would not grow it exclusively; but let us give it a good show, and put it on its proper plane, and show when it should be used and when it should not be used—give it its proper place in January, February and March.

Mr. STINSON (Peterborough): I planted out 17 Ben Davis sixteen years ago. They started to bear six years after planting and have been bearing ever since. This last year I took 86 bushel off those trees, and took 80 bushels of good salable apples out of the lot. From my experience I would sooner grow the Ben Davis at 50 cents a bushel than any other apple at a dollar.

Mr. TURNER (Cornwall): I have eaten Ben Davis in July—my own growing.

Mr. CASTON: I saw a specimen that was kept for two years, and they were not rotten then—they were only shrivelled.

Mr. BOULTER: I would like to ask Mr. Dempsey if the Ben Davis is successful with him.

Mr. DEMPSEY (Trenton): The Ben Davis has proved to be one of the most profitable apples we have planted, and the Spys one of the most unprofitable. I would not advise planting the Spy on any consideration, unless for a man of great wealth who could wait for it. I would rather see him plant some Duchess or Wealthy or Ontario—such apples as come into bearing and he can get his money out of them. Spys stand for a great many years, and you do not get your money out of them. I have now some 400 trees some sixteen years planted, and the total crop off these, two years ago, was some twenty barrels.

Mr. BOULTER: What cause do you give for them not panning out?

Mr. DEMPSEY: When the Spy in our section comes into bearing it bears for about four or five years, then it goes to pieces.

Mr. CASTON: That is the way they did in our section.

The PRESIDENT: I think I shall ask Mr. Beall a question that possibly he will be very glad to answer. I think he took a very great deal of pains in the preparation of this report. Now, we find it necessary, as years roll on, to make changes. How shall we accomplish that in the best way? I find the western counties strongly urge that Ben Davis be placed on the list. It is not on the list now.

Mr. BEALL: When that list was adopted by the committee they had no idea in the world that it was going to last for ever. We expect it to be changed from year to year; but a great deal of care should be taken in making a change. I think a change should not be made merely because one particular variety is very much liked in one particular orchard. I think the matter should be well considered. I think the Association in the first place decided on something which was as near perfect as can be within the limited number. We are only to allow five varieties of winter apples. Mr. Boulter could not understand why the Northern Spy was not placed on there. Well, a great many others no doubt think the same. The reason was simply this: Being limited to number, and also to certain characteristics—for instance, they were to be limited to varieties that could be successfully and profitably grown. The Ontario is mentioned here, instead of the Northern Spy. They are so nearly alike that it would be absurd to put in the two. The Ontario was believed by that committee, and by a great number of other persons, to be the more profitable of the two. This list was to be a guide for persons in planting orchards. With regard to the President's question, I have a scheme to lay before the Association in connection with the paper I am to read here, that will embody this and a great many other matters connected with apples and fruits generally. I suggest that this matter be dropped until I read my paper. It simply means this: I propose having a committee appointed that shall be permanent, and that shall, subject to certain limitations, take all these matters into consideration, condensing the reports, and putting the lists in such a shape that they can be easily understood—epitomising, as it were, all the transactions in connection with new fruits and these matters also.

The SECRETARY: One point has been brought before us very plainly by this discussion: that certain apples are suited to some districts, and succeed wonderfully well there, but fail when planted in other districts. This list will be complete when we know what suits each separate part of the country. Formerly our Association gave just one list for all Ontario. That was found to be very faulty, because the apples that were recommended for general cultivation only suited certain parts; but now we have divided it into thirteen parts, and we are trying to find the apples that do the best in those thirteen sections, and we may subdivide it more by-and-by. The Cranberry Pippin, which Mr. Boulter spoke of as being not very desirable in Prince Edward County, is a great success with me in the County of Lincoln. This year, when I ought to have had two or three thousand barrels of apples, I only had two or three hundred. That is what I call a failure in the apple orchard. However, the Cranberry Pippin constituted the chief part of the crop that I had this year. Most other varieties failed, but the Cranberry Pippin was fairly successful, and the apples were clean and beautiful—there were very few culls, and they were the most desirable apple I had for market. Now, in all the Niagara District the Cranberry Pippin is a very fine apple, beautiful in appearance and very fine as far as quality is concerned. The Spy also succeeds in the Niagara District. It is too tender for some northern sections; but where it succeeds and colors properly we find the quality is beyond criticism. We found in Chicago that there was no Canadian apple that was so much in demand in the western States and cities as the Canadian Northern Spy.

Mr. BOULTER: Was there any apple to compare with it?

The SECRETARY: I don't think so; and if you go through the Chicago markets and ask, "What apple are you selling most?" they will say, "The Spy;" and if you ask the commission men, "What is most in demand, they will say, "Your Canadian Spy." Commercial orchardists in Canada have several questions before them. One is: "What can I grow best in my district?" The next is: "What market am I shipping to?—is it the American market or the English market?"—and so on. You have to consider what the people want in the market you are shipping to. (Hear, hear.) And these questions will influence us all as to the varieties we plant; and if we have planted them, and they are not the kinds we want, we must top-graft them. The Ben Davis as grown in the west, in Oregon and in British Columbia, is most wonderful—twice the size we grow it in Ontario, four times the size they grow it in Prince Edward Island. It just emphasizes the truth of my statements.

Mr. BEALL: The speaker just now stated that the Northern Spy would not perhaps do in the northern or colder parts. I would like to know where that is. I know where there is a long row in an orchard fully one hundred miles north of Lindsay, and they are bearing well, as they have borne for several years.

The SECRETARY: Do you know how long it is planted?

Mr. BEALL: I do not. I have a memo. at home of the locality and name of owner, etc.

Mr. CASTON: I can corroborate a good deal of what Mr. Dempsey says. In the lower end of Simcoe County the Northern Spy thrives very well. In North Simcoe it does just as Mr. Dempsey says,—after it bears a few years it begins to fall apart. That has been the experience of growers in our section. Now, travel about thirty miles south and you will find old trees there growing all right, and bearing every year; and I don't know that you will get any better specimens in Ontario than you will in South Simcoe.

Mr. BOULTER: Why do you condemn it and throw it out of your list?

Mr. CASTON: I am not condemning it; but that is the reason I did not wish it put on our list—that after it bears a few years it gets rotten in the heart and begins to fall back. But I have proved by experience that it can be grown where any apple can be grown, by top-grafting. That is a very important matter, and one that deserves attention. You can grow any apple that can be grown in any other part of Ontario by grafting it above the crotch, on healthy limbs. It brings them into bearing earlier. As to quality, of course tastes differ. I would say the King is by all odds a better desert apple than the Spy, but it is not nearly such a good bearer.

Mr. BOULTER: I have about four hundred Spy trees and have not lost one tree. They have been out 12 or 14 years.

Mr. CASTON: They have not come to the failing part of the business yet. (Laughter.)

The PRESIDENT: In reference to Mr. McNeill's remark about the Ben Davis being so good, I would say that the judges at the World's Fair would score the Ben Davis from Nebraska in quality as high as 10; but when they would come down to Canada they would only score it about 8. So with the Kieffer pear. Out in those southern and western states they seem to have better quality in their eyes than we have in this country, farther east and north.

Mr. BOULTER: I would suggest that we defer this discussion till Mr. Beall's paper is read.

The PRESIDENT: Is that your pleasure? Carried.

FRUIT GROWING IN ONTARIO AND HOW TO MAKE IT PAY.

Mr. A. M. Smith, of St. Catharines, read the following paper: Fruit growing in Canada in the past has been a series of experiments, many of which, on account of want of knowledge of what varieties were adapted to the soil and climate of different localities, have been disastrous failures. But enough have been successful to demonstrate the fact that most if not all the fruits grown in the temperate zones can be grown here in greater perfection, taking, keeping and quality into consideration, than in any other part of America, if not in the world. Thirty years ago the larger portion of the fruit consumed in this country was brought from the United States. The Mother Country then knew nothing of Canadian apples. To-day we are not only independent of these States as far as these fruits are concerned, but our apples stand at the head of theirs in the markets of the world, and we have shown in competition at their own great World's Fair that Canada stands second to none in the production and excellence of this most useful commodity. This being the fact—is it not well to ask themselves the question—What is to be the future of this great industry—Are we to rest contented with present achievements, or are we to press on and develop the vast resources at our command? There is no other country of the same extent that has as much land as we have bordering on lakes and large bodies of fresh water, which is particularly adapted to growing the apple in perfection, and although we have not as large areas adapted to growing pears, peaches and grapes and some of the more tender fruits, we have enough to supply our own markets and some to spare for our neighbors; and plums, cherries and most of the small fruits can be grown wherever the apple succeeds. And when we consider the increased demand for fruit, the increased consumption, the markets already opened up in the old country and the neighboring States, and the markets opening up in the newer portions of our own country, where fruits can not be grown with success, and think of the increasing facilities for preserving fruits, such as canning, evaporating, etc, so that they can be transported to any part of the world, we can easily see that this industry is but in its infancy. And if we but carefully improve the advantages we possess and systematically develop our resources it will soon become a vast source of income and prosperity to the country. The question then of how best to accomplish this object, or in other words how to make fruit growing pay best in the future, is one that deeply interests us as fruit growers. While I do not consider myself competent to answer this question in full, I may be able to offer a few suggestions that will be of value to planters. As I remarked in the beginning, many of us have had serious failures from planting varieties not adapted to our soil or climate. This need not be repeated if we, as members of the Fruit Growers' Association, avail ourselves of the information obtainable from it, watch carefully the experience of our neighbors, and remember this rule, "Plant only fruits that are adapted to your soil and locality and the markets you want to supply." Don't plant too many varieties. Five or six of the leading varieties of apples or any other fruit are all that are profitable in any one locality, and when these are planted they have got to be carefully cultivated and fed in order to make them profitable. No starving the orchards or robbing them with other crops must be allowed. In order that fruit growing may pay in the future it must be engaged in more as a business than in the past. The chief attention given to other products of the farm and a little, or entire neglect of the fruit will not make it pay. The fruit grower has to be educated then to attend to his business. The adaptation of different fruits to different soils and localities has to be considered. While I do not believe as, the saying is, in "putting all your eggs in one basket," I would say to the planter "if your soil and location is particularly adapted to the growing of pears or plums or any particular variety of fruit make that fruit a specialty particularly if there is a market and demand for it." The cause of many failures in the past, and I fear will be in the future in fruit growing, is so many people embark in the business without any knowledge of the principles and requirements necessary for its success. They imagine if they get into a peach section, for instance, they can grow peaches on any soil there, and the same with other fruits, not knowing that in our best peach belts there is comparatively but little soil and a few choice localities where that fruit succeed well. Consequently not only a knowledge of how to grow fruits but a knowledge of where to grow them is

necessary. The day is coming when nothing but first-class fruit put up in first-class shape will pay and in order to secure this result we must give careful attention not only to cultivation but to the destruction of insect pests and the prevention of the various fungous diseases which our fruits are subject to. In the matter of grading and putting up fruits for market also, there has to be a radical change with some of us. I think we might take a few lessons from our California competitors in this matter. If it pays them to carefully wrap their fruits in tissue paper and put them in neat boxes why would it not pay us? I believe the time is not far off when our choice Spies and other apples will be carefully wrapped and sent south and to California in exchange for their oranges, lemons and other citrus fruits. But I need not enlarge upon this subject—members of the Fruit Growers' Association can readily understand it. While I would advocate only the planting of tried and known varieties for profit, I would by no means discourage the trial and testing of new fruits with the hope of making valuable additions to our present stock of valuable varieties. Doubtless the experiments of the future will bring out many additions to those already produced by our Arnold, Dempsey, Saunders and others whose labors in this direction perhaps did not pay them in dollars and cents, but which will be of untold benefit to us and future generations. While I regret that our government has not taken hold of this work and given us an experimental station for it, I still cherish the hope that our future legislators will awake to the importance of it and do something worthy of the cause and the nation, and not leave this important work to be performed by individual effort and at individual expense. I am aware that the Dominion government, at their experimental farm in Ottawa, with their efficient staff, are doing what they can there; but on account of a climate unadapted to fruit they can do but little comparatively for the great fruit growing sections of the country. I would, therefore urge upon the members of this Association, particularly the younger ones to redouble their efforts in this direction, not only by producing new hybrids and seedlings, but also by testing new importations as far as their means will admit, and disseminating them till Canada shall be known not only as the best fruit growing section but for the best varieties produced in the civilized world, and if it does not pay you in dollars and cents it will pay in the increased prosperity and blessings that it will bring to your country and posterity. Most of the pioneers of fruit growing in this country have passed away, and the remainder will soon follow. They have done well in building up this great industry, and the results are left in your hands. Try to improve them.

The PRESIDENT: Now, gentlemen, we will be very glad to hear from you all. The valuable paper you have heard is open for criticism.

Mr. BEALL: Referring to the suggestion in the paper that the Government should encourage hybridizing, I would like to ask: Why has not this Association taken that matter in hand? The Association has never, as far as I know, done anything to impress that fact upon the Legislature of Ontario, except the publication of an article in last year's report intended to draw public attention to the matter of remuneration to any person for their efforts in that branch. I think there should be some public acknowledgment and remuneration from the Government to persons who have already done work in this direction. If that were done it would possibly encourage others. I believe there is but very little being done in that respect. Fifteen or twenty years ago there were five persons who did much for this Province in hybridizing—Arnold, Dempsey and Mills are gone; Haskins we never hear of—I do not know what he is doing; we have only Saunders left, as far as I am aware. This country and this Association have done nothing to my knowledge to recompense these men for the time they have given, the care they have taken, and their experience and labor in this very important branch.

Mr. MCNEILL: I think we should appoint a committee and do something worthy of this body in this matter. The gentlemen named by Mr. Beall are worthy of recognition and possibly a few might be added to the list. I should certainly suggest the addition of the late Mr. James Dougall, of Windsor, a gentleman who has done perhaps as much as any of those mentioned. You will have noticed the Windsor Cherry, lately written about in the *Horticulturist*. It was my pleasure, sitting in the shade of that tree, to hear the history of the Windsor Cherry. Mr. Dougall also originated lilacs that are

famous the world over. People do not usually connect his name with the Persian lilacs that are now being disseminated. I know a gentleman that has half a dozen moss roses that were the result of his hybridizing. The town clerk of Windsor has a collection of gooseberries that were given him by Mr. Dougall ; and the township clerk is responsible for the story that one of the finest gooseberries now on the market—I think the Industry—was stolen from Mr. Dougall ; that he sent it to London, and it afterwards made its way across the lines under a new name. Now, could we not appoint a committee who would gather these instances of hybridizing experiments, and let us do honor to the men as far as possible. Mr. Dougall died poor, and I believe as the result of the interest he took in horticultural matters in that line.

Mr. EDWARDS : Would it not be well, while we are honoring the dead, that some provision should be made to encourage this line of experimenting for the future? The last speaker has not given a favorable impression of the profits.

Mr. MCNEILL : It doesn't pay.

Mr. EDWARDS : Still I think this might be done, possibly, if we could so impress the Ontario Government or the Ottawa Government with the desirability of making improvements in this direction as to make it possible to benefit the country to introduce new varieties either of apple trees or of other varieties of fruits, that the Government might be persuaded to offer a standing reward for the production in the future of improvements in varieties of fruit of various kinds. A man would then be likely to receive from the Government a sum that would to some extent compensate him for his labor, which would be similar to the benefit of a man obtaining a patent.

Mr. CASTON : I appreciate, and have often spoken publicly of the obligation that these progressive men placed us under ; yet I do not think the plan of a government reward would be wise. Some of those men, at least, have made money out of their productions. Some of them no doubt have been unselfish in their work, but others work for the hope of reward. I do not think there is any more reason why the Government should offer a reward for them than they should for a patent. We are told that the company that had control of the Niagara grape made about half a million dollars out of it. I know I have paid $3 a dozen for strawberry plants, and somebody must have been making money out of them (laughter). And a great many of them turn out to be worthless after all. But I think it is only fitting and proper that we should acknowledge in some public way what these men have done towards making Ontario what it is to-day as a fruit-growing country.

Mr. BOULTER : It is pretty hard work to do much good to a man after he is dead. It is very well to speak in eulogy of these men, but the trend of public opinion is, not what has been done but what is going to be done for the good of the future? I think this Association would be doing something for the coming generation if they pressed on the governments the necessity of establishing more small experimental stations, in different localities than at present, where new fruits could be tested and the results given to the public. We have to learn by experiment what is best. Now, the Government can afford to do this, and they ought to do it, so that we may have positive knowledge as to what fruits are suited for the various localities. I don't think we could accomplish much good by endeavoring to get a grant for those who have gone before. We find it takes a long time to get a monument to a man after he is dead, no matter how much good he has done.

Mr. DUMBLE : I think that the best experimental farm you can have, and the most extensive and the most certain in its results, is the country just as it is. Now, take the action of our Ontario Government in getting those fruit statistics. Supposing they had sent several questions to each farmer—because they wrote directly to each—thus : "What apple have you found thrive best on your farm, in quantity and quality?" "When do your trees come into bearing?" and so on. Would not the results from these questions tabulated, be the best possible data you could get anywhere ? They would get more figures in that way than in any other possible way. I throw this out to Mr. James as a suggestion for a series of questions next year. I know from experience that if you group Northumberland and Durham with Peterboro' and Haliburton you have not a fair group. The

trees that will grow on the lake shore, on the other side of the summit, as we call it—ten or twelve miles from the lake—would be under totally different climatic influences on this side of the summit, so that this group, for designating the apples to be grown, is not fairly grouped to get good results. I suggest you should divide the country into smaller sections; and, within a radius of ten or twelve miles around Peterboro', you could tell from what fruit we could get results better, than by grouping those four counties named here. I don't think we ought to complain very much about either government, they are doing very handsomely in regard to these experimental farms.

Mr. CASTON: The difficulty Mr. Dumble mentions is one we have in all the districts classed here; but we can't help it. For instance my district takes in Muskoka. Of course, in a great part of Muskoka they cannot grow anything better than a crop of apples, anyway; but when you come as far south as Lake Couchiching and take in Lake Simcoe, they can grow any variety of apples as well as any part of Ontario. When you get beyond the influence of the great lakes, and get into the great prairie countries, you may travel for 150 miles without noticing any appreciable difference in the climate. Probably the thing that will flourish here will flourish 150 miles farther on; but owing to the influence of the lakes this country differs so much that you will find a fruit will do very well in one place, and 30 miles further up it won't do at all.

Mr. DUMBLE: Down on the shores of Rice Lake, 10 or 12 miles from here, they grow cherries very successfully. We can't grow them here at all.

The PRESIDENT: Do cherries thrive here?

Mr DUMBLE: No, sir; unless it be the commonest cherries and they are grown along the shores of Rice Lake. The horse chestnut will not flourish here.

Mr A. M SMITH: I understand they are quite successful in growing cherries at Ottawa.

Mr STANTON: I don't think there is any section in Canada that will grow cherries and plums with South Monaghan, and that is only 10 or 15 miles south of this. I have seen trees there with ten bushels on them of the Lombard plum.

Mr. BOULTER: Mr. Smith suggested that in time we would be wrapping our fruit up, as they do in California. Has anyone had any experience in sending apples to the Old Country in any way other than in ordinary barrels? I ask this question because the Australian people are sending their apples there in packages quite different from ours.

The SECRETARY: I have experimented in wrapping in tissue paper, and I believe in some instances it will pay. I don't believe it would pay to send apples that way for general sale on commission, because unless people know you, and know your fruit, they want to see the apples, and it takes a good while to unwrap them and find out what you have rolled up. They think you want to deceive them, perhaps, and so have hidden your fruit. If your brand is known, and your reputation is secure, it will be an advantage, because they carry better; decay cannot spread from one apple to another; they preserve their bloom a great deal better; they will be dry, and open out in better shape. The cases where I have tried this plan successfully were those where I had made a special sale. I had special orders from private parties—in Edinburgh and one or two parts of England—where people wanted a few barrels for their own special use, and had confidence that I would put them up to please them; and I was able to make the sale at $4 a barrel, delivered at my own station, for apples put up in that shape. That was satisfactory to me. Of course, I was careful, when wrapping them, to put nothing but the very finest class of apples in for wrapping, and the result was that I have had repeated enquiries from those parties to have apples shipped to them successive seasons. This year I did not feel that I had the quality of fruit to do for them, so did not attempt to fill their order; but I believe that a business could be done in that way if we could once get in close enough connection with the consumers in the Old Country. (Hear, hear.) If we could once get by the middlemen who make the money out of us, and deal directly with some consumers that are willing to pay high prices if they can get just what they want, there are no doubt large numbers of people in England who, if they only knew us, and could get near enough connection with the Canadian growers, would order freely, and

be willing to pay us our own prices. They would not hesitate to pay us $4 a barrel for our apples put up in that shape if they could depend on the brand. The opening is not for everybody—it is for those who know how to do the thing right. If you are putting up a special brand of fruit, I think it would pay to put it up in tissue paper. I tried shipping pears in small crates, about one-third of a bushel, and I had hoped for success; but the variety I tried was one I suppose nobody will ever get through to England—viz., the Bartlett. I thought I had picked them sufficiently on the green side, and that by pushing them through speedily I would succeed; but I didn't. When they reached their destination they were all mush.

Mr. BEALL: Did you try Flemish Beauty?

The SECRETARY: I did not.

Mr. PATTISON: I believe the late Mr. Dempsey had some experience.

Mr. DEMPSEY: He shipped none except in 1886. They carried over perfectly. Of course they went over in connection with the Colonial Exhibition. They sold well there at that time, according to the Government reports.

Mr. HILLBORN: I shipped some at the same time, of Duchess apples and several varieties of pears, in bushel cases. They went in cold storage, of course, but few of them reached there in good condition. Those that did arrive sold at good prices, and the parties who handled them thought they would pay. The only difficulty was to get them there in good shape.

REPORT ON PEARS.

The PRESIDENT: Is the Committee ready to report on pears?

Dr. BEADLE: I have in my hand several copies of the old report, on which the Committee has marked in ink, opposite each variety, the change that they suggest. After I have finished my report I think it would be a good plan for the meeting to take up this list and criticise each item, and let us know what they think of the value the Committee has placed upon the several varieties for dessert and for home market. I have said nothing about cooking. At our last meeting it was decided, I understood—and this list was printed in accordance with that decision—that we would omit any account of cooking. I may say that the Committee came to the conclusion, after looking the matter all over, that they were not appointed to make out a list for planters. If you will notice in the Report, page 137, the catalogue is said to be for use of judges on exhibitions, consequently they think that the division into summer, autumn and winter is not necessary. They recommend that the list be finally printed alphabetically, without any reference to the season of ripening. Judges do not care anything about the season of ripening. At exhibitions the prize-list usually calls for the best plate of Bartletts and the best plate of Beurre Giffard, etc. Then, again, there is this difficulty about settling on the time that these pears ripen—we have a tremendously large country as to climate. We have an almost sub-tropical climate on the north shore of Lake Erie, and we have an almost Arctic climate up in Muskoka; and a pear that will ripen, say, on the 1st of September in the County of Essex, will not ripen till October up in Muskoka, if it will grow at all there, consequently there is great difficulty in deciding about the time—the classification that we should make of the different varieties of pears as to summer, autumn and winter. The difference is even greater than I have spoken of. You may take the shore of Lake Ontario near Grimsby, along from St. Catharines to Hamilton. Close on the lake shore, where the spring winds from the lake keep vegetation back quite late, you will find the Bartlett pears will be two weeks later than they will be ten or five miles inland. Then comes the question—is the Bartlett a winter pear or a summer pear? It is a winter pear just under the brow of the mountain; it is a summer pear on the lake shore. Taking all these things into consideration, your Committee have decided not to take notice of summer, autumn and winter, but to arrange the list alphabetically. I would suggest, therefore, that you take up this list and find out from those present who have had experience in these different varieties, whether we are right in our estimate of value for dessert and for home market.

The PRESIDENT proceeded to read the list.

Belle Lucrative was changed by Committee from 10 dessert, 4 home market, to 7 dessert, 6 home market.

The PRESIDENT: How should this pear be so high for dessert and so low for home market?

Dr. BEADLE: Its appearance was against it, and it was hard to get people to buy it. It is a very sweet pear, and there is a moderate sale for it, but on the whole it does not "take" in the market on account of its lack of color. It is always green; it never has any color.

Mr. SMITH: But you have raised it two points for the home market.

Dr. BEADLE: Yes; we dropped it for dessert. It is sweet, and that is all you can say about it. It has no richness of flavor—just sweetness

Mr. BOULTER: What was the reason for raising it two points for home market if the color was against it?

Dr. BEADLE: The color was against it, but as there are people who like a sweet pear, they thought it ought to be raised a little for home market. Mr. Orr will be able to tell you more about it. I deferred to the experience of persons who had marketed it.

The PRESIDENT: If no change suggested in that, we will go on with the rest.

Flemish Beauty, changed by Committee from 8 and 9 to 8 and 8.

The PRESIDENT: Why did you drop it for home market?

Mr. CLINE (Winona): Because it is a miserable pear to raise. It does not begin to compare in selling with the Bartlett. We have the Bartlett only at 10, and it is certainly fair to put it two points lower. I would like to have it only at 7.

Mr. BOULTER: Wouldn't 7 be pretty high?

Mr. CLINE: If you can grow them they sell pretty well.

Mr. BOULTER: Can you get two successive years' growth from them?

Mr. CLINE: No.

The SECRETARY: Would you plant any of them for the home market?

Mr. CLINE: I would not, except for grafting Beurre Gifford or some other on. We must consider this, that Flemish Beauty are always in the list of pears for varieties; no list is considered right without it.

The SECRETARY: You don't encourage anybody to plant it?

Mr. CLINE: No; all good collections have the Flemish Beauty in them, though.

Mr. BEALL: I think it is a mistake to speak against a particular variety because it cannot be grown in some particular section or in several sections. The principle should be that wherever a valuation is given on a fruit, it should be a perfect specimen. Then the question arises. If a man anywhere in any part of the Province can grow a first class Flemish Beauty, should it be rated at a high rate? My own opinion is it ought to be rated as if a first-rate specimen was grown. We can grow them that will average very nearly a pound apiece, perfect in size and shape, and of a beautiful red or brown color. If pears can be grown like that, I do not see that you ought to try to prevent the people from growing it. It depends altogether where it is grown. I know it scabs in a great many places, but I think the scab is not such a bugbear now as it has been in the past. I think that should be left as it was.

Mr. BOULTER: We have been buying pears for eleven years and I never yet, with the exception of one year, got good Flemish Beauty pears—buying from different parts of Canada. It is almost impossible to grow them without being cracked or specky.

Why it is kept rated as high as this I don't know. If this list might deceive buyers into thinking this is a standard variety, or help nurserymen to deceive them, it should be changed—otherwise let it remain. It is not going to deceive me when I am buying it. I would not give for a Flemish Beauty 50 per cent. of what I would for a Bartlett.

Mr. M. PETTIT: This scale of points should not be considered as the pear is found in the market—affected by this fungus—but as it is when perfect.

Mr. CLINE: That is what we supposed—that when you put pears on the table you put perfect specimens. We did not get this up for a planting list, though people might plant by it and not go very far astray.

The PRESIDENT: I would suggest that somebody move the adoption of this report; then any change would come as an amendment.

Dr. BEADLE: I will relieve the chair of a dilemma by moving the reception and adoption of this report.

Mr. M. PETTIT seconds.

Mr. BEALL: I move in amendment that the Flemish Beauty figures stand as they are in print—8 for dessert and 9 for market.

Mr. BOULTER: I move in amendment that the points for home market be reduced to 7.

Mr. ROBSON seconds Mr. Beall's amendment.

Mr. HILLBORN seconds Mr. Boulter's amendment.

Both amendments were lost, and the original motion carried, making the figures 8 for dessert and 8 for market.

Kieffer, changed from 3 and 5 to 4 and 6.

Mr. BOULTER: With us it is not a success.

Mr. MCNEILL: We used it in our home last year as a canned fruit almost exclusively, and I think for market purposes it is a somewhat valuable pear. It has simply one fault as a canning pear—those little granules. For flavor in home use I think it is simply exquisite.

Mr. BOULTER: Has it been hardy as a grower?

Mr. MCNEILL: Yes, and it is a fine-looking pear. It sells well on the market.

Mr. BOULTER: I planted out half a dozen trees, and I lost every one of them. As to canning, the only true test is putting up thousands of cans by dry steam. The Kieffers won't do for canning at all. We would not think of putting them up in our factory; they won't stand up in the cooking.

Mr. A. M. SMITH: Some years ago I planted about 40 trees; this year I gathered from them about 175 12-quart baskets. Last year—the sixth year—they had on probably about 50 baskets. They are early, and a constant bearer. This year I sold them to the canning factory at Grimsby for 2½ cents a pound. They wanted all I had, and more, too, if I could get them. I have friends who grow them largely on the other side, who claim that they are the best pear they have for canning there.

Dr. BEADLE: This is a variety of pear that the Committee expected a good deal of kicking about, because it depends for its quality on the soil in which it is grown more than any other pear I know of. In Prince Edward County it would be poor and have no quality, but at Grimsby, or on the shores of Lake Erie, it would be very fine and desirable. I have seen some of very fair quality grown by Mr. Cline at Winona. I have eaten them from tins, and they had a very pleasant quince-like flavor peculiar to themselves. When prepared in the way these were, they lost none of their firmness, and seemed to be very desirable for canning. I find the public are asking for it and buying it in the Toronto market—I suppose for canning.

Mr. M. PETTIT: Some few years ago I planted 25 trees at Grimsby. The fourth summer they were out they netted me $1 each; and they came into bearing so early, and bore so heavily, that this spring I planted 1,400 more, and I think I can make more money on them at $1 a barrel than growing apples at $4 or $5 a barrel.

Mr. EDWARDS: Mr. Stinson has at some of our Peterborough meetings spoken very highly of the Kieffer pear for canning purposes, and they were grown in this county.

The clause was passed without change.

Dana's Hovey, quoted at 8 and 4—no quotations hitherto.

The PRESIDENT: That is a considerable drop.

Dr. BEADLE: It is good for nothing for market. It is good enough for amateurs.

Lawrence, changed from 7 and 8 to 8 and 6.

The PRESIDENT: Why was that lowered?

Dr. BEADLE: Because someone who had had experience in marketing it suggested it. I can only ask my colleagues to explain, as I have had no experience in marketing it myself.

The SECRETARY: I think the Committee is about right in that. It is an excellent pear for dessert—nothing we like better for home eating—but the size and color are somewhat against it.

Mr. A. M. SMITH: My family generally market all I can grow of it. I don't think it would be a very bad pear for market this time of year. I am inclined to think they have put the market value too low. If kept till the Christmas season and sold on our markets, it brings a very good price.

The PRESIDENT: I certainly would like to move that up a little for market.

Mr. SMITH: I move that it be increased two points for market—that is to leave it where it was.

Mr. CLINE: One particular reason we put that so low is that all pear shippers know that there is not much market for winter pears in Canada. You send pears to market now, and you would scarcely sell them at all. Just a few baskets will sell, and a small pear will not sell as much as a big one.

The PRESIDENT: I think the finest pears to go on the market to-day are Beurre D'Anjou and the Lawrence. When we can raise the Lawrence in its dessert qualities we should not put it back in its market. That is giving it a "black eye"—and it is too good a pear to get a black eye.

Mr. HILBORN seconded Mr. Smith's motion.

Mr. EDWARDS: It is a pear that will grow well here.

The motion was carried to leave it at 8 for market.

The report as a whole, as amended, was then adopted. (See Appendix III.)

The SECRETARY: It has always been our custom to appoint a committee to examine and report on the fruit. I would move that a committee be appointed by the chair for that purpose.

Mr CASTON seconded the motion. Carried.

The PRESIDENT: I would now call for Mr. Hall's paper. I am sorry it is so near the close of the session, but we can take it up again at our evening session and complete the discussion of it, if there should be need.

SOME NOTES OF TRAVEL THROUGH SOME AMERICAN ORCHARDS AND GARDENS.

The following paper was read by Mr. H. L. Hutt, Horticulturist at the Ontario Agricultural College, Guelph :

It was my privilege during the past summer to visit a number of the most prominent sections of horticultural interest across the line as well as in our own province, but I have thought it best at this time to speak more particularly of what I saw being done by our American cousins over the border. By so doing probably we shall be able to learn a few lessons from them.

If then you will go with me in an imaginary trip, we will leave Ontario at Niagara Falls, and after three or four hours' ride we stop at Geneva, situated at the head of Seneca Lake, in the Southern part of New York State.

This is one of the finest fruit growing sections of the State and here are to be found some of her most extensive nurseries. One mile out of town is the State Experiment Station, where, under the direction of Mr. Beach, excellent work is being carried on in the horticultural department. Much is being done in the testing of small fruits. This summer there were 230 named varieties of strawberries being tested side by side, and there were 430 unnamed seedlings fruited for the first time. One of these gave promise of being valuable on account of its extreme lateness, coming in after all others had gone.

The strawberry rows are all mulched in the fall. In the spring the mulch is removed till the ground is cultivated, then put on again. Rye cut green, in which there are no weed seeds, is sometimes used as an early summer mulch ; this is left on for the season. The collection of gooseberries is said to be the largest on the continent. They have been importing largely of English varieties and now have about 200 English and American varieties in bearing, with a lot of untried seedlings coming on. In the larger fruits there is nothing of very marked importance going on besides the testing of insecticides and fungicides.

But in the neighboring country are to be seen some of the finest orchards to be found most anywhere. The first we will visit are those owned by the Maxwell Brothers. These gentlemen were formerly extensively engaged in the nursery business, but now give most of their attention to fruit growing. One of their farms, about four miles south of Geneva on the lake shore, consists of 300 acres, nearly half of which is in fruit. The other half is devoted to stock raising, most of the manure from which goes to the orchards. The three principal fruits grown on this farm are plums, quinces and cherries. The land is a rather heavy clay, but is given the very best of clean, level, cultivation. An excellent tool for this work we will find in use. It is a spring tooth harrow in two sections, that can be raised and lowered by a lever like our Wisner cultivator, but instead of having wheels it slides, when the teeth are out of the ground, on a pair of runners like a sleigh. Mr. Scoon, the manager of this farm, says that, "To take hold in heavy land and work easily up close to the trees, it beats anything tried yet." Another tool we will find in use here for working close under low-headed trees is the Morgan Grape Hoe. This tool might be of great value to vineyardists in this country. It is drawn by one horse attached to the side of a tongue and consists of a broad blade on the end of a horizontal arm which works under the trellis, and can be worked in and out around the vines by a revolving disk guided by means of the left handle. It is a very simple tool, and cost them $12. Mr. Scoon tells us "it has paid for itself many times in a season in the saving of hand hoeing." It might not do that on every farm, but on this one we find they have about 20 acres of cherries, thirty acres of quinces and eighty acres of plums.

Besides the extent and high cultivation given, the method of pruning is a noticeable feature of these orchards. On plum, quince, and peach trees they practice the "shortening-in" method of pruning. That is every winter the new wood is cut back within six or eight inches of its growth. This keeps the head of the trees very symmetrical and compact, and with the peach tree, in which the small inner branches naturally die out, no

doubt it is an excellent method, but on the plum tree, where the inner branches do not naturally die out, there is a danger of getting the heads so dense as to shade too much the fruit in the interior of the tree. They claim, however, that although a little later this ripens up fully as well as on untrimmed trees The advantages claimed for this practice are that the trees bear longer ; the fruit is more easily picked ; the heads are smaller and more easily worked around : and the curculio more easily managed.

Their method of fighting the curculio is to capture and cremate him. The curculios and string fruit are gathered in a sheet ten or twelve feet in diameter made like an inverted umbrella, and suppported on a light two-wheeled barrow. A slit in the sheet opposite the handles allows the tree to enter to the centre. The limbs are jarred with a padded bumper and everything in the sheet rolls into a tin drawer at the bottom. These "bugging machines," as they call them, are made in Geneva and cost $17. Six of them were seen at work the day of our visit.

The shot-hole-fungus is more troublesome here than the black-knot. Last year a lot of the plum trees were destroyed by this disease. The leaves fell in the summer before the wood had matured and the severe winter only helped to finish the work of destruction begun by the fungus.

Out of fifty or sixty varieties of plums tried in this orchard, the favorite varieties are the Reine Claude, Bradshaw, Genii and Purple Egg—the Reine Claude being more grown than any other.

Their thirty acres of quince orchard is a rare sight to see. No unshapely, scrubby bushes like we usually find, but all handsome little trees with a three-foot trunk and a head, by "shortening in" pruning kept as round as a ball. These receive the same clean cultivation as the plum trees and much the same treatment throughout, except that in the early spring the plums get two or three applications of nitrate of soda ; one pound to a tree at each application. This gives them a very luxuriant foliage, but makes the fruit a little later in ripening. It is to avoid this late ripening of the quinces that they receive little or no nitrogenous fertilizers.

The quince trees are doing best on the lowest parts of the orchard, while peach trees alongside of them are doing best on the highest parts. The orange or apple quince, the old stand-by, is the only variety grown. The crop last year on this quince orchard, we are told, sold for $3,500—on the trees. There are about 6,000 trees.

The cherry trees received the same high cultivation as the others, but are not pruned back. The Early Richmond, one of the best of the Morello type, is the chief variety grown.

If we visit Messrs. Hammond & Willard's orchards and nurseries we shall have to do some travelling, for they are scattered here and there in fifteen, twenty and thirty acre lots, two or three miles apart.

They have the largest fruit nurseries in this section ; while W. D. Smith has the most extensive nursery of ornamentals. Mr. Willard's orchards are all under very clean cultivation. They consist mostly of plums and peaches, but the varieties in the orchards are as mixed as the man on a chowder board, for Mr. Willard is a firm believer in working over a variety that does not suit him. In nearly every plum orchard we find them hard at work capturing the "little Turk" with the "bugging machines." Mr. Hammond still has faith in spraying and is waging war on them with London purple.

It might be pleasant for some of us to spend more time in the beautiful orchards about here, but we must hasten on.

At the Cornell University Experiment Station at Ithaca, forty miles further on, we may find a number of young Russian Apricot trees heavily loaded. This may be encouraging to some of us from the Niagara district, who have planted rather largely of this fruit and are still doubtful as to the success of the experiment. We may congratulate ourselves, however, on being able to beat anything we may find elsewhere in grape growing. In Stamford Township may be seen a two acre vineyard, only three years from planting, that this summer bore ten tons of grapes. I am sorry to say, though, that these went to the wine factory for $20 per ton.

In another vineyard almost across the road from this, where the soil is just as good and the vines twice as old, there was not one-quarter the crop. Good cultivation is the secret of the difference.

If on our way to Chicago last summer we had stopped off at Lansing, Michigan, we might have seen at the State Experiment Station there, a striking experiment on the effect of sod in an orchard. One half of the apple orchard was under good cultivation and the other half in sod. Although there was little or no fruit on any of the trees this year, the contrast in the vigor of the trees was very marked. The foliage on those in sod was turning yellow at the end of August, while those under cultivation were still as fresh and green as in June.

Leaving now the orchards and fruits we will continue from Cornell, along the winds and curves of the Lehigh Valley R.R. to New York, to see some of the large market gardens of the east.

The first place visited is the establishment of the great seedsman, the late Peter Henderson. Here I expected to find large seed testing grounds, but found that the grounds, and greenhouses covering nearly a couple of acres, are now almost entirely given up to the growing of ornamentals for sale. But out on Long Island are to be found a number of the large gardens that help to supply New York and Brooklyn. At Jamaica, ten miles out of Brooklyn, is one of the finest vegetable gardens on the western end of the Island.

There are thirty acres in potatoes. These are planted one foot apart in rows two and a half feet apart, opened by a fertilizer drill, which by means of projections on a wheel following in the furrow measures and marks the spot for each piece of potato. The potatoes are not hilled, but the ground is gradually worked up to them with the cultivator. The potato beetles are kept in check with Paris green applied with a barrel sprayer, spraying four rows at once. In potato growing, however, I value more the experience of a Niagara grower who raises twelve or fifteen acres every year, and is probably one of the most successful potato growers in that district. He takes his seed potatoes out of the cellar a couple of weeks before planting time and puts them in a warm shed to start the growth. Just before planting they are cut and sprinkled with freshly slacked lime. Experiments with and without liming show a marked difference in favor of liming. His favorite method is to plant in a well manured clover sod, plowing in the potatoes in every third furrow. The potatoes are dropped eighteen inches apart on the shallowed or mould-board side of the furrow. As soon as the tops begin to appear above ground, a harrow is put on and the ground thoroughly harrowed. In cultivating the soil is worked gradually to the rows. Out of a large number of varieties tested the most profitable early varieties are the Early Ohio, Toronto Queen and Burpee's Extra Early, and for late varieties the Empire State, Rural New Yorker No. 2, and Beauty of Hebron.

But we must stay in the Jamaica garden on Long Island to see the sights in growing rhubarb and asparagus. There are about four acres in rhubarb, the plants standing 4½ x 2½ feet apart. These are cropped but two years in the open ground. The roots are then taken up and forced in the greenhouses for winter market. The stalks are of immense size, very few of them shorter than a foot and a half. The asparagus, Conover's Colossal, is truly colossal, each stalk being eight or ten inches long and as big around as a hoe handle. To suit the fashion of the New York market this is all bleached perfectly white. The bleaching is done by banking the earth in the spring twelve or fourteen inches high over the crowns of the plants, and as soon as the stalks appear on the surface they are gathered by cutting from below with a long knife. They are then bunched in two pound bunches, cut square at the bottom, washed clean on the outside, packed in barrels, and sold in New York for fifteen cents per bunch. The immense market wagons used by all the New York and Brooklyn gardeners are quite in keeping with the extent of the business. These wagons alone cost $300, and generally carry all that can be drawn on a good road by one team of horses.

There are plenty of fine gardens to be seen on Long Island, but to see one of the most extensive vegetable gardens of the Eastern States, if not in the whole of the United States, we must visit that owned by W. W. Rawson, of Boston, the author of that

valuable little book "Success in Vegetable Gardening." Mr. Rawson has two hundred acres in garden, and devotes thirty acres to the growing of cauliflowers. The soil is a rich sandy loam, and kept filled with manure. Although so extensive, the closest system of cropping is adopted. All of the smaller vegetables, as beets, onions, carrots, radishes, lettuce, etc, are grown in rows one foot apart and kept clean with hand weeders and the Arlington scuffle hoe. This hoe has a gauge on it regulating the depth to which it can be worked, making it quite a safe tool, even in the hands of an awkward workman.

There were eight or ten very large greenhouses in connection with this garden, where vegetables are forced for early market. One of the largest houses is 400 feet long by 50 feet wide, and another of the same size is being built alongside of it. This large house is devoted entirely to the growing of cucumbers. It is divided lengthwise by six walks. The vines grow on each side of the walks and are trellised over head, forming six beautiful green arches 400 feet long, under which the cucumbers hang in abundance, where they can be easily seen and gathered. The White Spine is the only variety grown. These are picked when about eight inches long, and sell in Boston at from $6 to $25 per hundred according to the season. They were planted about the 1st of January, and occupy the house till August, when the vines are cleared out, and a crop of radishes and lettuce grown for the Christmas market, before the cucumbers are again planted.

Other gardeners in the neighborhood who have not such houses, grow the cucumbers under sashes, resting on long frames made by setting planks on edge. A foot of manure is put in the bottom and covered with a half a foot of loam. When the vines have filled the frames, and the weather is warm enough, the sashes are taken off and the vines allowed to run at large. When the crop is off the frames are removed, the land plowed and planted with celery.

Probably we have spent time enough for the present among the fruits and vegetables, and those who have an eye for the beautiful may wish to spend some time among the ornamentals to be found in the Arnold arboretum and the city parks. We will stop to speak of only one or two of these. One of the handsomest hardy climbers very common here and in many parts of the state of New York, is the Japan Ivy (*Ampelopsis Veitchii*). This will climb and completely cover a brick or stone wall with a beautiful mat of bright green leaves. Unlike the English Ivy it is deciduous, the leaves turning to a bright crimson in autumn before falling. To what extent this may be grown in Ontario is doubtful, but it is well worthy of a more extended trial. The purple beech (*Fagus purpurea*), with its large dark purple leaves, is a very pretty lawn tree much grown about Geneva.

At La Salle, in New York State, a few miles from Niagara Falls, may be seen a fine collection of hardy ornamentals on the grounds of E. A. Long, one of America's most popular authors on landscape gardening. One very pretty clump here cannot fail to attract our attention. It is a mound having for its centre the purple leaved plum (*Prunus Pissardii*), and around this a border of the smaller growing Cornelian Cherry (*Cornus variegata*), with its varied green and white leaves.

Probably most of you are already weary after all our wanderings, so I will leave you here to rest and enjoy the beauties of the scene, within hearing of the roar of Niagara's mighty cataract.

Dr. BEADLE: In reference to the Japan Ivy, I presume it will grow well enough here, it grows well in Toronto. All that it needs the first two years of its life is to protect it a little, especially to cover up the surface of the ground over the roots with a few leaves. No matter if the plant does get killed back for the first year or two, it only enables it to spread more; and if it does not get killed back it ought to be cut back so as to keep a mat of foliage all up the wall. If properly trained, it is one of the most beautiful climbing plants we have for those who wish to cover a wall. (Hear, hear). It will cling by its own tendrils. The end of the tendril flattens after it touches the wall, and seems to adhere to it very much as we say the fly's foot adheres to the glass as it is walking over it. It looks as though there is a little vacuum under the spread of the tendril, and if you undertake to tear it off you will break the tendril, but you wont break this little adhesive portion from the wall at all—you will have to scrape it off. It fastens itself as it climbs, and makes a perfect little sheet of foliage, that during the summer mer is bright green, and in the autumn is of the autumnal hues of our ordinary *Ampelopsis*.

Mr. TURNER: We have the Japan Ivy in Cornwall unprotected.

Mr. MCNEILL (Windsor): It is finer on the north side than on the south side. We have some fine examples of it in Windsor.

Prof. CRAIG (Ottawa): I would like to ask the writer of the essay if he learned the name of the variety of Russian apricot that was in the vicinity of Geneva.

Prof. HUTT: No, I did not get the name. I have an idea, though, it is the Alexis.

Mr. MCNEILL: One of the most remarkable things in that paper, to me, is the experience in the matter of spraying. Prof. Cook of Michigan, and the Cornell student and everybody else, reported that all you had to do was to go out and spray your trees, and curculios and everything else would disappear; but here we find them back again to the old-fashioned article, and it appears to me a little explanation is necessary from the gentlemen at the experimental stations. I find, without exception, all favor the new modes of spraying. Here we have our good friend reporting that right along here spraying has not been a success, and they are going back to the older—and apparently the better—methods. That struck me as rather peculiar, and I was not prepared for it after what I read in my other reports.

Mr. PATTISON (Grimsby): I spoke to Mr. Willard, of Geneva. He can't trust an ordinary man to go ahead and spray properly. We all know, particularly in the case of plum trees, if they are sprayed with too strong a solution, it will not only injure the tree, but may kill it. In a short time, enough damage may be done to completely offset the value of spraying; but where there are small orchards, and you have men that you can trust, as in our district, as far as curculio is concerned, plum-spraying is actually satisfactory.

Prof. FLETCHER (Ottawa): During four or five years I have had a good deal of correspondence in reference to the result of spraying, and I summed it up lately very much as this gentleman has said—that if the work is done carefully the remedy is quite satisfactory; but if it is not done carefully, or if you trust people to do it who are not fit to do it, the results will be disappointing. The experiment stations have employed men who have taken probably more care than the ordinary orchardist and fruit-grower takes in carrying out those experiments, because the one object they have in view is to know whether that remedy is satisfactory or not; whereas the fruit-grower's first idea is to save the crop, and not the absolute question of whether it is a satisfactory remedy or not. Where the work is done carefully, with due regard to the circumstances of the case, the results are satisfactory. A discovery of very great importance, namely, mixing lime with the arsenical poisons was made two years ago. I think it should be made known as widely as possible. The lime has a neutralizing effect on the causticity of these poisons, and the uncertainty will be less than if you use the Paris Green, and trust to others to do the work; but this is the very place where such matters should be discussed, and in fact, is the one question I came to hear discussed at this meeting.

Mr. M. PETTIT: Will lime-water neutralize the poison as well as lime?

Prof. FLETCHER: No; lime-water, I believe, is not strong enough. Prof. James, who I see is present, can tell us if this is the case as well as anybody.

Prof. JAMES: I should think lime-water would hardly do, because lime-water is very weak.

Dr. BEADLE: I submitted that question to the chemist at Ottawa, and he wrote me a letter. In that letter he shows why lime-water will not be sufficient. You cannot get enough lime into the water to answer the purpose, because if you try to increase it by increasing the quantity of water, then you will dilute your other solution too much. I think that is about the result he arrived at.

Mr. CASTON: There is another idea that paper brought out that we sometimes might learn something from the Americans in the matter of implements. (Hear, hear.) There seems to be a great deal of ingenuity about them; they seem to be the first to invent anything that will lighten and cheapen labor. I think a man in Canada is kept back if he has not the proper implements.

The PRESIDENT: I will name as the Fruit Committee: Prof. Craig, E. B. Edwards, and Geo. W. Cline.

EVENING SESSION.

Mr. Caston: I want to ask Prof. Fletcher in reference to an insect that is so very common that we never took much notice of it in past years—that is the grasshopper. During the last season, that was one of the most destructive insects we had in our section, because, after they could not do any more harm to the farmers, they invaded the gardens and ate the young apple trees, and sometimes attacked the apples themselves; and they sometimes destroyed the vegetable gardens also. I think this is a pretty difficult insect to deal with. Some years ago, when he was very bad out in Kansas, one of the comic papers represented him as a soldier, and called him General G. Hopper. We want to know how to fight him; because it is the opinion of a great many that if we do not have severe frosts to destroy the eggs, we will have enough of them. If they increase in our section in the same proportion as they did last spring, there will be enough of them to eat up every green thing in the country. I thought that Paris green was a sufficient cure for almost any insect, provided you could get it to eat it. I tried it on turnips, but the grasshoppers devoured every turnip. They even ate part of the bulbs. I tried Paris green first mixed with water, but the turnip leaf is so glossy that it will not stay on it. Then I tried it with plaster and flour, and it would adhere to the leaf, but the mystery was that those leaves were all eaten, and on examination I found only one dead grasshopper; and I am inclined to believe he died from natural causes. (Laughter.) The Paris green seemed to have no more influence on them that it would on a graven image. I consider Prof. Fletcher one of the best authorities on entomology that we have in this country, and I want him to tell us how to fight Gen. G. Hopper, if he comes next summer.

GRASSHOPPERS.

Prof. Fletcher: I feel somewhat that I am in a delicate position speaking here this evening. You had your programme already made out, and I do not believe in any outsider coming in—especially myself, who had not the possibility of telling you whether I was coming or not, so that there was no arrangement made; but I shall speak for a short time on your invitation, and I hope that what I say may be suggestive of further questions on matters upon which I may be able to give you some light. As to the grasshoppers, I do not wish to put myself up as a prophet, but I think we shall not have the same visitation as we had last year—in the same districts where those insects were bad this year. The excessive increase of any particular pest is due generally to some exceptional circumstance; and, as you are all aware, last summer we had exceptional drouth in many parts of Ontario. From the crop reports you will see that the grasshopper plague extended over some areas in Ontario. This gave a chance to the grasshoppers. Regarding the suggestion that a cold winter would destroy the eggs, it is just as well for everybody to understand that the most excessive cold is not going to affect the eggs of any insect at all. The eggs of insects are prepared by nature to stand the conditions of the climate where they are found—in all places, at least, where an insect pest increases in large numbers. Insect eggs have been submitted to very great temperatures of heat and cold—far greater than are found in any place in nature—by artificial means, and they have not been found to destroy the eggs at all unless the eggs were brought into unnatural conditions. The life of our common grasshopper is simply this: The eggs are laid in the late autumn. Each female lays about four pods or collections, of eggs. The eggs are arranged in four rows, and there are seven to ten in these rows. The eggs are deposited by the female, which bores a hole in the ground, generally in the sand—and in passing I may mention that grasshoppers are generally more abundant in sandy districts. When the eggs are laid they are covered with a glutinous material by which they hold together like a little pod. The eggs are beneath the surface of the ground, and when there, no extremes of cold will affect them in the least; but we find by experiment that if these pods are broken up, or brought into an unnatural condition, they are easily destroyed.

In the States of Minnesota and Dakota, where grasshoppers are numerous every year, and sometimes extremely so, and do a great deal of harm, one of the best remedies is supposed to be to plow up the stubble late in the autumn, by which the eggs are exposed to the winter frosts and laid bare so that they may be attacked by their enemies—predaceous birds, and other insects and animals. Where this is done, the occurrence of these insects next year is very much less, so much so that the State of Minnesota passed a law making it necessary for the farmers to plow their stubble in the autumn; and if they don't do it, it is done by the State, and the farmer is charged with the amount of the labor. The next means relied upon is a machine called the "hopper doser," or tar pan; and this consists of a pan ten feet long by two feet wide, turned up at the back 18 inches and at the sides are side pieces of wood or iron soldered in. To these at each end rings are attached and this pan is drawn over the fields or pastures—and you will probably all have noticed that grasshoppers are most injurious in pastures of long standing. That simply means where the eggs were laid. We find these insects are very particular as to the choice of a proper place to lay their eggs; and in this part of the country they are laid in old pastures. In the West they are laid in stubble fields; and where these stubble fields cannot be plowed regularly in the autumn it is found very profitable to draw the hopper-dosers across the fields in the spring. On the top of this pan is placed some gas-tar or kerosene emulsion, or water with a little kerosene on the top. These are drawn across the fields before the insects have got their wings. Roughly speaking, it would be about the 1st of July in Ontario when these insects develop their wings. The eggs hatch early in spring; the young grasshoppers pass five moults, and then they develop their full-grown wings; but before that is done they are very largely at our mercy, and if these tar pans are dragged over the fields they are gathered in great numbers. In Minnesota they are destroyed by thousands of bushels in the spring months. This is found a practical remedy. Probably in western Ontario, if these insects are in such numbers next year, it will pay farmers and others to apply this remedy to their pastures—because in the early part of the year the young grasshoppers live in the pastures or in the grass meadows; and although we do not notice them very much in the hay lands, they are generally there in very large numbers; they do not show so much and the extent to which hay lands can be injured without it being observed is very great. In experiments carried on by Professor Osborn in Iowa, 35 per cent. of the grass could be saved on crops which were measured out and treated by these pans being drawn over them three or four times during the early months. That being the case, how much better it would be for all farmers systematically to do this; for not only are there grasshoppers which destroy this important crop of grass, but there are numberless other smaller insects. These insects that Mr. Osborn was treating were a small leaf hopper, similar to that called thrip, on vines. This diminishes the crop of grass every year; and if these grasshoppers are abundant next year, farmers ought to be on the look out early to make use of this remedy, because until the insects get their wings they are unable to fly very far from where they are born. As to Paris green on turnips, it is very important for fruit-growers to know that it may be made to adhere to such plants as the turnip and cabbage, and all such as have that waxy glaucous covering, by mixing soap in the water before you mix the Paris green. As to Paris green not having effect on grasshoppers, I think possibly it had effect on a good many but their places were taken by many others. There is a remedy sometimes used in California—mixing bran and arsenic and sugar together; and this is made into a sticky paste, and about a teaspoonful is used about the bottom of each vine in vineyards. The grasshoppers do not fly very much in hot weather, and instead of mounting into the vines they ate this poisonous material and were killed. In experiments I tried five years ago at Ottawa, when the grasshoppers were very abundant, I made some of this mixture; but there I saw very little effect, because no sooner were the grasshoppers killed by this mixture than they were eaten up by their companions. A little flour in water will also make the Paris green stick. In regard to the plum

SPRAYING WITH ARSENITES.

curculio discussion, it is a very important thing that we should recognize how we stand as to that. Either spraying Paris green is a good thing, or it is not. I am not con-

cerned whether it is or is not, except as an entomologist. We have been advocating this remedy for ten years, and if it is a failure our work has to be done over again. The number of successful experiments has so far overbalanced the unsuccessful that the latter are not worth mentioning. The records of five years correspondence are almost universally in favor of spraying; yet we must not forget that failures are often not reported—and that is the one question I want to ask you here. Are there any that have failed, after having taken the proper precautions, and carried out the directions with care? I know very many instances of success. I know very well that Prof. Weed, of Ohio, sprayed alternate trees with Paris green, and checked the trees that were left unsprayed. On the unsprayed trees most of the plums fell; on the sprayed trees 75 per cent. remained. I remember when the remedy was first proposed, Mr. Hilborn sprayed here and there through an orchard of a hundred trees; and the sprayed trees were the only ones that had any fruit on them. Mr. Rolph has told me of an instance where he sprayed, and the crop was so large as to break down the trees. I have tried spraying, and my correspondents have tried it, and it has been successful. Now, if this method is a failure we want to know it so that we may change our methods and save the loss that has occurred. My conclusion in regard to spraying plum trees for curculio and apple trees for the codling moth is that the protection is sufficient in all instances to warrant people in applying it. Mr. Sidney Fisher, of Brome, in the County of Knowlton, Quebec, never sprayed his trees till this year, when he used the Bordeaux mixture and Paris green to treat at the same time the black spot of the apple and the codling moth. I saw his orchard in September, and he challenged me to find a single injured apple in the orchard. There were some trees that were well loaded with fruit. I could not find a single apple in his orchard that had a codling moth injury in it, and I don't think there were any that had black spots. From my experience I think the generalization may be made that 75 per cent. of the crop of plums and apples may be saved by spraying trees—in proper proportions and at proper time—with these poisonous arsenites. If I am wrong in that, it is important to the rest of Canada that I, at any rate, should know it, because I have the responsible position of making the recommendations every year to the farmers and fruit-growers of Canada.

With regard to the use of lime mixed with the arsenical poisons, for my own part I prefer Paris green, and I put in my mixtures an equal amount of Paris green and freshly slaked lime. It is true that London purple, being an arsenite of lime, is a little more convenient to mix with the lime mixture called Bordeaux mixture, but if you put a small surplus of lime in your Bordeaux mixture, Paris green is equally successful. Paris green is a substance with an exact chemical formula which demands a certain percentage of arsenic. London purple, being a waste product, has not that set and constant amount, therefore it is not so sure. What we want is an exact proportion of poison, so that we may get the result that we look for.

Mr. Boulter: Which is the best time to spray the plum trees?

Prof. Fletcher: As soon as possible after the flower has dropped.

Mr. Boulter: And the apple tree?

Prof. Fletcher: Directly after the petals have dropped.

Dr. Beadle: I think it is advisable to spray before the blossoms open at all.

Prof. Fletcher: For what?

Dr. Beadle: For the scab.

Prof. Fletcher: Oh, for the scab on the apple, certainly.

The Secretary: Sometimes spraying for plum curculio seems to be a perfect success, in other seasons it does not. How is it that in some seasons we seem to attain perfect success, and in others we do not? I have been wondering whether it was not because we did not make the first application early enough, and whether it is not an advantage to apply it on the young leaf even before the blossom appears at all? Do you think that the parent curculio eats the young leaves, and that by poisoning the young leaves they might thereby be destroyed?

Prof. FLETCHER: Yes, I think it might be a good suggestion, for this reason: The plum curculio is about before the leaves open, and it has also been found, in confinement, to eat not only the young leaves before they open fully, but also the young bark and the young twigs; and therefore if the poison could be made to act on the parent beetle it would be a good remedy; but we do not know exactly what is the effect of this treatment. We do not know if the insect is poisoned by eating the leaves, or whether the females are prevented from visiting sprayed trees. I think there is no more representative body in Canada than this to which we can appeal as to the value of such remedies. We should have a sufficient number in this room who have either failed or succeeded in their use to settle this question at once. For my own part, I cannot think of a discovery more important to fruit-growers than the discovery of these methods of spraying trees. In a large collection of different plants you will find some varieties or species in the genus are attacked by insects while others are left untouched. That points to the fact that some are injured more than others. I think that some of the failures may have arisen from the fact that some plum trees are more susceptible to the attacks of the insect, or the insect is more attracted to them; and where the very decided reports of success have followed, it may be that the insect is not so much attracted. All this could be checked in a series of experiments carried on for two or three years. There are one or two insects that have not appeared at all this year, where they were very destructive before, and that brings me back to speak about the grasshoppers. We know that all insects that appear in very large numbers are attacked by their own parasites. It is supposed that every insect known has its own special parasites, and sometimes these themselves are attacked by parasites. Some of these parasites are described from the actual insect from which they are bred. When grasshoppers are abundant, you will find many of them that have red mites on them; these are parasites which are feeding on the insect and destroying a large number of them. Again, there are parasites which live inside of them. Sometimes, in crushing a grasshopper, you will see a large white maggot, like a meat maggot. This is one of the tachina flies which are very active in destroying the grasshoppers. The egg is laid on the skin of the grasshopper after hatching. It eats its way inside, and lives upon the juices of the body until it is full grown; it then emerges and after a time turns to a fly. Many of these insects are destroyed by the gordius worms, which may sometimes be seen in water swimming and look like a piece of horse-hair. It is supposed by the ignorant that horse-hairs thrown in water will turn to these worms. It is nothing of the sort. These are parasites which have lived in insects, and then got into the water, where the eggs are laid, and then they enter the insects again in some of their preparatory stages, and live inside them as parasites. Speaking of insects which were not so abundant as usual, the white cabbage butterfly, which is usually so abundant at Ottawa, was noticeably absent this year. We usually have to sprinkle our cabbages two or three times a year with pyrethrum powder; this year it was hardly necessary at all. This year one of the worst pests was the root-maggot. We found this might be controlled with sufficient success to make it pay by mixing hellebore with water and putting it around the roots. Some experiments were made with salt, and these pointed certainly to success; but in some experiments I tried the results were so contradictory that they will have to be tried again before any definite statement can be made about them. One insect which I should like to ask St. Catharines or any western fruit-growers about, is the peach-bark beetle—a very small beetle. I found it very abundant last spring at St. Catharines. It was a very wet day, and the gum which had exuded from the bark in some of the peach orchards could have been scraped off in handfuls. On minute examination I found it was the beetle that had been boring in the bark. I doubt if it enters the wood at all; but it was an injury to the tree to have the bark injured to the extent it was then. I should like to know if any of these gentlemen have tried any alkaline washes. With regard to borers, it is known that the best measures are preventive; for successful treatment it is necessary to find the time the beetle is abroad and lays its eggs on the tree. This would probably, with this insect, be in June. As we have no peach trees growing at Ottawa, I have not the opportunity to test washes on the bark, but I presume any of the well known alkaline washes or kerosene emulsion would be satisfactory.

The SECRETARY: Tell us what the insect is like.

Prof. FLETCHER: It is hard to describe. It is very small—not longer than a sixteenth of an inch—and under the microscope it is very easily recognized by the shape of the antennæ, the blades of which lie together like a fan; and it is the only insect that attacks the peach which has the antennæ of that kind. It lives burrowing in the bark.

The SECRETARY: It would escape our attention easily?

Prof. FLETCHER: It would unless you were examining to see what caused the gum on the bark. Mr. Fisher, of Queenston, brought it to my notice first, and then Mr. James Sheppard sent me specimens afterwards. The fruit pests of the year have not been very important. As I have not prepared any address, I will not take up any more time, but if there are any questions to ask, your time will be better employed in asking them and I will do my best to reply.

Mr. CRAIG: The apple curculio?

Prof. FLETCHER: What is generally discussed under the head of apple curculio is nothing but the plum curculio; and the plum curculio attacks apples almost as much as it does plums. There are some features about insect pests that are hard to understand or explain. In the State of Maine their worst enemy is the apple maggot. I do not know a single instance in Canada where this insect has caused any trouble at all; and yet it is common through all the country, feeding in the fruit of the hawthorn. There is hardly a bush that you can examine that you don't find some of these apple maggots, and I have bred it frequently, as well as the apple curculio. The latter, in the district around London, has been found injuring apples; but it is rare in my experience to find it injuring apples. I have some plum curculios that were bred from apples from the Eastern Townships, which were brought me in the spring, attacked both by these and the codling moth. To spray with Paris green should in most cases be sufficient. I believe in this orchard Mr. Craig brought me those apples from the spraying had been done and it was not successful, whether it was that the Paris green was not of a sufficiently pure nature, or that the spraying was imperfectly done, we do not know; but it was a careful man that did it, and a man who has had good success in the use of these poisons before. There is no book treating of the apple but lays great stress on treating the canker worm. At Ottawa it is most exceptional for that insect to attack the apple at all. The maple and other trees were almost defoliated. It is an easy insect to fight; it is merely a matter of spraying the trees when the larvæ are seen upon them. I have no doubt that the apple curculio could be treated the same way as the codling moth, and at the same time.

Mr. BOULTER: What proportion of Paris green is used for apple trees for spraying?

Prof. FLETCHER: One pound in 200 gallons. It is very important to observe that proportion, and not put one pound in ten gallons, as some people do.

A DELEGATE: The oyster-shell bark-louse?

Prof. FLETCHER: It is better to treat this pest twice, early in the spring before the buds burst, and in June when the bark lice have legs. This is only for a few days after emerging from the mother scale. It crawls to a suitable place and inserts its beak through the bark, and at once begins to form a waxy coating for itself, and by the autumn it is simply a scale covering a bag of eggs, and these eggs will not hatch till the following spring. Kerosene emulsion made of coal oil and soap-suds—two gallons of coal oil to one gallon of soap-suds; add ten to twelve times the amount of water before you use it. A spray-pump is a necessity now for fruit growers, and you probably all have them; if you have not, it is a very good thing for you to get.

Mr. BEALL: I know of two persons this year who have used the Bordeaux mixture with Paris green, and I have good reason to know that the same formula exactly has been followed; both used precisely the same quantities of everything. One of the men failed entirely, insomuch that he destroyed the leaves of his trees so as to nearly ruin his orchard, or at least injure it very materially. The other had no injury whatever. On strict enquiry afterwards it was found that where the leaves were injured the lime had been two or three years old, but it was slaked, of course—would that have made the difference?

Prof. FLETCHER: Decidedly it would make a very large difference. It would simply be chalk by that time, and have very little effect on the copper mixture.

Mr. BEALL: You would recommend to have new lime?

Prof. FLETCHER: As new as you can get it If it is not quite new, use double the quantity. Everybody who has tried to make the Bordeaux mixtures finds it is a very inconvenient thing, because the lime made in this country is very difficult to slake thoroughly. In Australia the lime is made from marble, and it slakes readily into a powder; in England it is made from chalk, and does the same; but our lime does not easily disintegrate. It is easier to put in a larger amount of lime than you require, and get the milk of lime off it, and not bother with the residue afterwards. What does not run through your sieve, throw it away—don't bother with it. In mixing lime with Paris green, the proportion I find convenient is one pound to one pound —the same amount of lime as of Paris green.

Mr. BOULTER: What quantity of Paris green would you want to kill ordinary tent caterpillars? Could you kill them by spraying with the mixture you have mentioned?

Prof. FLETCHER: Undoubtedly. They leave their tent to go on to the leaves, and when they eat the leaves they die. That is strong enough for anything—one pound in 200 gallons.

Mr. EDWARDS: How often do you recommend spraying apple trees?

Prof. FLETCHER: It depends very much on the season. For the codling moth the recommendation has always been to spray it directly the petals drop from the flowers. There is an idea, among apiarists at any rate, that when the honey is being secreted in the flowers spraying trees is liable to poison the bees. Whether that is correct or not, we do not know; we can get the results we want by spraying at the time I mention. Then, after that, a fortnight later, it is considered well to spray twice, at any rate; and three times is surer.

Mr. EDWARDS: Are there other worms that bore into the apple later in the season?

Prof. FLETCHER: No; but there are two broods and sometimes there is also what we call a half brood—that is, an exceptional brood will develop—a brood that should have gone over into the winter will emerge in the fall and lay their eggs where the apples come together. Sometimes it is a very large brood, but generally it is a very small one.

Mr. EDWARDS: It was a very large brood this year in Peterborough in July and August—in some cases the fruit was almost eaten up.

Prof. FLETCHER: Was that even where they had been sprayed?

Mr. EDWARDS: The spraying had been done in the early part of the season.

Mr. PATTERSON: I have noticed that after spraying thoroughly the early part of the season, along the end of July and August there comes along another brood.

Prof. FLETCHER: Yes, sometimes a large brood and sometimes not large. In California there are always three, and sometimes four, broods of the codling moth.

Mr. HILBORN: Can a tree be protected from the moth by mechanical appliances?

Prof. FLETCHER: Yes; but many of the caterpillars will spin their cocoons before they get up to the protectors. I do not think it is such a practical remedy as the application of Paris green.

Mr. HILBORN: A firm in London who manufacture these protectors claim that Prof. Saunders says they will prevent from 75 to 80 per cent.

Prof. FLETCHER: Their claim is probably made on Prof. Saunders' book on injurious insects, which was written before the Paris green spraying was as well known as at present. I saw considerably over fifty specimens in one of the bands which was exhibited at London at the last annual meeting of the Entomological Society of Ontario,

where one of these was put on the tree. They cost ten or fifteen cents each, and whether it would pay the fruit-growers is, of course, a matter for them to settle for themselves.

Dr. Beadle: I think they would be very much more effective in catching the female canker-worm.

Prof. Fletcher: Yes, and the females of the canker-worm are unable to crawl over them while they are new.

Mr. Caston: I do not see if an insect is able to crawl up a tree, why it should not crawl over this protector.

Prof. Fletcher: They slope outwards from the trees and are very smooth inside when new. Of several specimens I watched, I saw nearly all drop as they got on that smooth surface. I did not find that they crawled over those while they were new. But as to the canker-worm, there is no doubt the remedy is to spray your trees while the caterpillar is on them. The great pest in Manitoba on their shade-leaf maple is the canker worm; and in the streets of Winnipeg for the last two or three years these trees have been almost defoliated by canker worms. This year Mr. Pinkham, of Winnipeg, used a spray pump, and got some others to do it, and the trees were to a large extent saved. Another pest there was one of the aphides, or plant-lice. The town clerk of Selkirk wrote to me, and I recommended him to use kerosene emulsion, and he wrote back that they had sprayed several hundred large trees and saved them. That was on the ash-leaf maple.

Mr. M. Pettit: In the Niagara district this spring the plum trees were very badly injured by the aphis on the under side of the scum of the plum, and on the young growth of wood. It made its appearance quite early and kept on increasing until the plums were the size of a marble. Where it was very thick over the fruit leaves it checked the growth of the trees, and the fruit withered and dropped, and it weakened the trees very much. We sprayed with kerosene emulsion. Where you can get that on to them it is all right; but it is simply impossible to cover any proportion of them, they were so thick, and you could not spray so as to strike up under all the leaves and touch them. If it appear another year, should we commence earlier, before they become so numerous, and what is our best means of fighting them?—because it is going to be a serious matter in growing plums.

Prof. Fletcher: Were they black plant-lice?

Mr. Pettit: Yes, but they appeared green when young.

Prof. Fletcher: That species has been successfully fought in the States—in New York and New Jersey—by using kerosene emulsion. The eggs are laid on the trees, and pass the winter there, and then they hatch in the spring, and if you treat your trees early enough you will have much less trouble.

Mr. Pettit: How early would you recommend?

Mr. Fletcher: I think as soon as the buds burst.

Mr. Pettit: They could be reached at that time; but it is simply impossible when the foliage is thick.

Prof. Fletcher: They are sometimes very injurious. One great pest in British Columbia last year was the apple aphis, and I have received a large number of letters saying that large fifteen year old trees had been destroyed entirely by the apple aphis. The kerosene emulsion has been tried by some satisfactorily. For plant-lice one part of emulsion to twelve of water would be sufficient strength.

Mr. McNeill: Is there any connection between the disappearance of these and the appearance of the little orioles, and the little bird that appears at the same time? I have actually seen these little birds go along and just eat them in countless hundreds—flock around and gorge right into where there was a mass of these insects—eat them out by the millions.

Prof. FLETCHER: I think the summer yellow bird would, but I don't think the orioles would.

Mr. EDWARDS: Year before last I saw a large number of these on the trees, and the kerosene emulsion did not seem to have any effect on them. I sprayed it on and almost destroyed the leaves. I made an emulsion of two parts coal oil and one of soft soap.

Prof. FLETCHER: There has been a good deal of harm done by the wide publication of an erroneous formula called the Cook formula. Prof. Cook tried to simplify the kerosene emulsion, and he got it so simple it would not work. The Riley-Hubbard formula is the one that is successful It has been worked out very carefully It is: Two gallons of coal oil and one gallon of soap suds—made of a gallon of water with half a pound of hard soap. I should like if anyone would let me have his address so that I may send the printed formula to him. It is as follows:

Mr. EDWARDS: I would suggest to our secretary the publication of the formula at the time it is needed.

The SECRETARY: That was done last year.

Mr. EDWARDS: One of our members not only destroyed the oyster-shell bark lice, but produced a much heavier growth of the trees, by a solution of carbolic acid, diluted with water, I suppose.

Prof. FLETCHER: It is almost impossible to get the crude carbolic acid—which is the article that is nearly always supplied—to mix with water at all, unless you first emulsify it. It can be made into a carbolic acid emulsion—which is made very much in the same way as the coal oil emulsion. Prof. Cook gives a formula, and he thinks a great deal of the carbolic acid, and it is very useful, no doubt, but the difficulty to get it to mix is very great. Mr. Boulter, who has a particularly clean orchard, treats it with domestic lye made from ashes, and with very satisfactory results—so much so that I had very great pleasure in drawing public attention to it in my annual report two years ago. In New Zealand and other countries they use concentrated lye diluted. Mr. Boulter put the ashes in a barrel and let the lye run through, and reduced that about one half. On the Experimental Farm we have trees almost as good looking as Mr. Boulter's, and Mr. Craig uses a soap wash every year.

Mr. BEALL: How is it applied?

Prof. CRAIG: With a white-wash brush, on the main branches and the trunk.

Mr. RACE: You will find that louse at the very tips of the smaller branches. Isn't it necessary to spray those?

Prof. FLETCHER: Undoubtedly. It has only the power of locomotion for about three days. It comes before that young shoot is being made, and it settles down on that young bark where it is thin. It then drives its very fine beak through the young bark and remains fixed there for the rest of its life. Where there is green bark it will attach itself to any part of the tree.

Mr. PATTISON: I have found an excellent remedy for both the borer and the bark louse is to wash the trees in June every year with a mixture of washing soda, soft soap and water.

Prof. FLETCHER: You get the same alkaline wash I have spoken of. With regard to the bark louse, some fruit growers claim it can be prevented from injuring the trees simply by feeding the trees, and that is part of Mr. Hillborn's method—to dig ashes around the trees in large quantities.

Mr. HILBORN: There is another insect in our part of the country that eats the cherries and the pears—the slug.

Prof. FLETCHER: Very easily treated with weak Paris green. It is more particularly injurious to the oak-leaved mountain ash and the hawthorne with us at Ottawa.

The PRESIDENT: How are you going to deal with it on the cherry? It is just at the season of the year when the cherry is pretty nearly ripe.

Prof. FLETCHER: I don't think there would be very much danger in putting on a very weak Paris green mixture. I have used that generally.

Mr. SMITH: There would be no difficulty in using slacked lime.

Dr. BEADLE: Have you had any experience in regard to the Bordeaux mixture in keeping it for any length of time—for a fortnight or so—to see whether it had lost its efficiency? I am under the impression it ought to be used pretty fresh.

Prof. FLETCHER: The first recipes for the Bordeaux mixture said: "Keep it for a time." That meant a day or so. If it is kept for a long time I think it does lose its strength. I enquired from Prof. Shutt, the Chemist, and he said, as far as I can remember, that some change took place.

Mr. BOULTER: A friend here says he took ordinary brick clay and rubbed his apple trees as a coating.

Prof. FLETCHER: That would prevent the eggs being laid.

Mr. W. M. ORR: How long does the curculio act on the plum?

Prof. FLETCHER: I think about three weeks.

Mr. ORR: Does spraying with Paris green effect the larvæ?

Prof. FLETCHER: No.

Mr. BOULTER: If you could tell me how to destroy the potato bug on tomatoes I would give you a donation.

Prof. FLETCHER: I think the only way is to plant potatoes near them and trap them. I must not take up more time, Mr. President. I am extremely obliged to you for allowing me to introduce this question of the value of spraying with the arsenites for insects. I know the plan is of enormous value to fruit growers; but I had heard lately rumors that the method was discredited by some; but what I have heard at this meeting proves that this is not the case.

The PRESIDENT: If it were not for tiring Prof. Fletcher out, I am sure we would all like to have him remain on the floor longer. (Applause.) We have Mr. G. W. Cline and the Secretary who have been practising these customs for some years. Let us hear the result.

Mr. G. W. CLINE: I have had quite a bit of experience in spraying Paris green. We have been at it ten or twelve years. I guess I was the first one to start it in our section, and I have had very good success. Sometimes through the rains it is not as satisfactory as I would like. It is pretty hard when you spray in the morning and it rains before noon, and when you spray in the afternoon it rains before night. However, I generally have a very good crop of plums, and have succeeded very well also with pears, though the curculio was very bad on pears.

The SECRETARY: How many times out of ten years have you failed with spraying your plums?

Mr. CLINE: I have not failed once.

The SECRETARY: You have had a partial failure some years?

Mr. CLINE: Oh, some years my crop would not be as heavy as others.

Mr. M. PETTIT: Have you left some unsprayed some years?

Mr. CLINE: Yes, and they never came to perfection, they all fell off.

Mr. BOULTER: Has any member been troubled with the curculio in the Damson plums?

Mr. CLINE: A good many persons have Damson plums in our neighborhood, and they always have a crop of them.

The SECRETARY: What do you think you spend per year in spraying plums?

Mr. CLINE: I generally spray my plums about five times in the season. I have sometimes sprayed them only three times. It does not cost very much. I use three

ounces of Paris green to forty gallons of water. I have never injured any trees, except to take some leaves off, when the water would begin to thicken in the bottom of the barrel. I commence spraying just as soon as the little covering drops off the plum. I have never found a curculio yet until after the blossoms were gone, and sometimes for a week afterwards. It is generally cool weather at that time, and the curculio won't work in cold weather. On a warm night they will work as lively as can be. I have left my trees watching for curculio for a whole week, and perhaps on Saturday it would come hot, and on Monday morning there would be any number of curculios and the plums badly stung.

The SECRETARY: The force of my question is this: that if you, after ten years' experience, have so much confidence in it that you will spray your orchard—which is a large one—five times in the season, it is a positive proof of the good results of your experience.

Mr. CLINE: I don't think I could get the success in any other way. I jarred them for several years, and, of course, it is tremendous work. You have to do it in the evening. Very seldom you find curculio on the tree in the day time; but from six in the evening until dusk, and in the morning from daylight until seven o'clock, they are thick, and then is the time we always had to jar. I found it this year a great deal easier in spraying. I got a horse power pump from Lockport, and I find it is a light job now to spray, compared with the hand pumps.

Prof. FLETCHER: Do you know the name?

Mr. CLINE: It was the Victor I got. It has worked very satisfactorily. It is driven by cogs and chain. The price is $70. It cost about $100 with the duty.

Mr. HILBORN: Do you find the foliage injured?

Mr. CLINE: No, I sprayed this year also with the Bordeaux mixture for the rot four or five times, until the leaves were white with the lime—I had a good deal of rot—and I think it helped them. I know it helped the Flemish Beauty pears. Where I didn't spray I didn't have any, and where I did spray I had a very fair crop.

The PRESIDENT: Now, Mr. Woolverton, we would like to hear from you.

The SECRETARY: I think Mr. Cline has ventilated the subject very well. I have also been testing it for eight or ten years past, and every year I spend a great deal of time in spraying my orchard. I do not omit it any season. I do not know that I need give you any greater testimony of my confidence in it than that fact, both for plum trees—though I am not so largely in plums as Mr. Cline—and also for the curculio in the apple and pear, and for the codling moth. In the latter I am confident of the great benefit to be derived from it. The codling moth has been exceedingly troublesome in the Niagara district in the past. Our apple crop has been frightfully diminished by this insect, and since we are using Paris green regularly we have a far smaller proportion of wormy apples.

Dr. BEADLE: What about apple scab?

The SECRETARY: I have been trying faithfully copper mixtures and some seasons I felt confident that there had been great benefit from it, but some years when we have tried most faithfully there has been no scab at all even on trees not sprayed, so that I don't feel prepared to report that I have had complete success yet.

Mr. CLINE: Have you had good success with the Paris green on the codling moth this year?

The SECRETARY: No, not very good on account of the rains.

Mr. CLINE: This is the worst season I have had. I have had more wormy apples than any year for ten years. There didn't seem to be any until just as the apples were ready to pick, and then you could notice they were getting full of such all over. It may have been a late brood—too late for the spring.

Mr. M. PETTIT: Is there any way that a fruit-grower can determine the quality of Paris green? A little of some brands put in a glass of water will color the water and appear to stay in suspension. Other brands you put in and it seems to curdle a little, or

collect together and settle more, and not color the water so much. Now, this brand that colors the water more, we consider the best to use. I would like to know if there is anything in this.

Prof Fletcher: I should rather think it would be the other way. The Paris green should settle partly at the bottom; but I think the best way of telling whether Paris green is pure or not is to dissolve it in ammonia. If it thoroughly dissolves it is pure.

Mr. M. Pettit: We are not chemists.

Prof. Fletcher: You need not be. Get a little spirits of hartshorn—or ammonia, for which it is another name—from the druggist. What is in the water is something in suspension, but it should not stay in suspension—it should sink to the bottom. Measures have been taken now to have all the Paris green that is sold in Canada of a pure and known grade. That is now being considered—(hear, hear)—and I think before very long there will be some legislation to insist on it.

Mr. Edwards: I have heard amongst farmers and others a great deal of dissatisfaction expressed with regard to the strength and quality of Paris green; and if some measure of that sort were taken it would be very satisfactory.

Mr. Fletcher: At any rate it would regain confidence. I find this, as a matter of experience, that if there is any id a about a remedy not succeeding, ninety nine per cent. of the people won't try it at all. As a matter of fact the adulteration of Paris green never amounted to ten per cent. of the samples we tested; but the idea got abroad that it was impure, and it was no use putting it on; so, instead of putting on a little more, or tryi g to find that out, they wouldn't put it on at all. So with this spraying, if there is any doubt about it a large number of people will not use it at all. I have found by experiment that it is worth a great deal, and therefore it is going to pay everybody to spray Paris green over their trees.

Mr. Boulter: I have been told by people selling it that Paris green is very expensive—about 40 cents a pound; that it is all adulterated to a greater or less extent.

Prof. Fletcher: That is not the case. I have been told by the man who makes two thirds of all that is sold in Canada, that when their travelers go out through Canada and offer Paris green at, say, 20 cents, the buyers say, "No, we want it second grade;" and they insist on having it, and he cannot get them to buy the best grade at about 5 cents more. The difference is between the pure and the second grade. They are prevented from selling it as "pure" Paris green, but they sell it as "genuine" Paris green.

Prof. Craig: I know some agents who sell this article to druggists as "pure" Paris green and Paris green "off color." The difference is 4 or 5 cents a pound. The difference in the actual value of the insecticidal powder is several dollars a pound. not only in the actual damage it does in preventing the spread of spraying, but as loss of faith in the remedy. Mr. Tweddle, of Stony Creek, has been conducting some experiments with me this last year in spraying plum trees for curculio, and one effect he seems to have attained is that Paris green applied with Bordeaux mixture is not as effective as Paris green applied alone. His experience is that the mixing weakens the toxical effects of the Paris green. That is very important to know, and if there are any present who have had experience I would like to know it. Mr. Tweddle's whole experiments this year have pointed to the fact that insects must have been very abundant, because I visited his orchard early in October and was surprised to find the trees that he had sprayed faithfully with Paris green had the apples largely on the ground.

Mr. Pattison: Don't you think it was an extraordinary late brood that didn't get poisoned at all?

Prof. Craig: He sprayed the 25th of July the last time.

Mr. Cline: Do you know if these were the same varieties of trees?

Prof. Craig: No.

Mr. Cline: Take the Duane's purple: you can hardly keep curculio off them.

Mr. RACE: Last year in the county of Perth we were troubled with curculio for the first time in my recollection. This year I used Paris green alone, and my neighbor used the Bordeaux mixture. We applied it about the same time, and were the only parties in that district that had any plums at all, so I am very confident of the success of spraying; but my experience was that my success with the Paris green alone was greater than his, although he put on just as much and did his work as thoroughly as I did. A great many of his plums did drop, and we found they had been stung by the curculio. In my case it was a very rare thing to find they had been stung.

Prof CRAIG: It is very often difficult to judge by a glance in an orchard, or even by looking through it, of the actual benefits of any spraying experiments. I have often at the end of a season's work been discouraged, in looking at the trees that had been sprayed, and those that had not, that I was unable to see a more distinctly marked difference; but on picking the fruit the result showed up very much more plainly and distinctly than I was led to suppose it would.

Mr. RACE: You think the Paris green is most successful.

Prof. CRAIG: I threw that hint out as a feeler. I shall try and get exact data on it next year.

Mr. EDWARDS: Will the spraying be as effective for the second brood of the codling moth as for the first, that is, those that lay their eggs between the apples, and so on?

Prof. FLETCHER: It will be more difficult to apply, on account of the large amount of foliage then on the trees; but where it can be applied it will be probably as effective, because any surplus of moisture will run between those apples and lodge there, just where the eggs are laid—in the calyx or cup of the flower. I do not remember seeing an apple injured where it hung alone; it is where there are two or three together. I think it would pay you to spray, but I don't think it would be as effective as the first spraying.

Mr. EDWARDS: When should that spraying be done?

Prof. FLETCHER: In July. The first time I have taken the first actual beetle at Ottawa is about the 26th May.

Mr. CLINE: I have found they make their first appearance about the 1st June.

Prof. CRAIG: Has anybody present had any experience in spraying peach leaf curculio with Bordeaux mixture?

Mr. HILBORN: This last spring it was not so bad as a year ago. We thought it was on account of the weather. A year ago we had a very wet, cold, backward spring, and the trees were very much injured. This spring trees that escaped the best before were the most injured.

Mr. SMITH: What would be your remedy for that?

Prof. CRAIG: Some information was given to me a short time ago which was new to me, and I asked the question in order to bring it out. A horticulturist from Australia told me he had most complete success in spraying peach curculio with Bordeaux mixture four times. It kept their trees in perfect health; and peach curculio there is one of the worst difficulties of peach growing. They began before the leaf was nearly out, and the sprayings were, I think, about a week apart.

FLOWERS AND THEIR RELATION TO US.

Mr. W. M. ROBSON, of Lindsay, presented the following paper:

By way of introducing my subject permit me to give a brief historical sketch with a few intimations on their commercial value. It would indeed be difficult to assign a greater antiquity to any industrial art than that which may be claimed for floriculture. The traditions and historical notices of this art refer to periods of very remote antiquity; ancient legends celebrate the gardens of the *Hesperides* and of the *Alcinous*, and authentic his-

tory tells of the Hanging Gardens of Babylon, by means of which a mighty king sought to reconcile his Median Queen to the flat and naked country of her adoption. The Persians appear to have cultivated gardens from their earliest period. The Grecians followed in the same steps; they formed gardens not merely for fruit and vegetables but for the cultivation of flowers. With them the narcissus, the violet and rose were in high repute, myrtle and box trees were clipped in fantastic forms, and flowers out of season were produced in their forcing pits; for violets in profusion could be bought in the markets of Athens while the snow was thick on the ground. In Ancient Rome flowers and fruits were placed under the guardian care of special deities, and floralia or flower festivals instituted. Indeed to such a pitch of extravagance was the passion for flowers carried that at one period it became necessary that sumptuary laws should be enacted to restrain it. Still the extravagant love of flowers predominated, for, at one single supper given by the luxurious Cleopatra, the roses alone are said to have cost an Egyptian talent—about $1,000 of our money. Nor was the love of flowers confined to wealth alone;—the humble hermit's cell had its little plot of ground for the growth of a few choice flowers for the chaplets and garlands of some favorite saints. The same love, admiration and devotion continued through all stages of history; for we find the immortal bard of Avon, through the fair Ophelia, so beautifully describing the virtue of flowers and herbs (in her method of madness), and still onward in their aggressive and subduing influence to the present modern times, where their worth and value is becoming an important factor of commerce, yielding large revenues in different parts of the old continent and thus giving employment to tens of thousands. But pursuing this idea my subject becomes unlimited, and still more so on estimating tropical productions, their merchantable spices and perfumes, of such immense value to them and the world, only to be overshadowed by the speculative wealth in floriculture on this continent. Think of $6,000 paid for one rose (the Bennett) and the fabulous prices attained for the orchids and many other new and rare flowers. Then if wealth is the pursuit of this period, here is an avenue open to it.

But I have grave forebodings that in this age, those beautiful gems of earth, that are exhaling a bountiful fragrance, enriching and exhilarating our very existence, are scarcely receiving a reciprocal response of gratitude or attention that is commensurate with their universal beneficence. It must be admitted that the present epoch of time is pre-eminently materialistic, speculative and inventive, and in this there is a danger of our finer feelings becoming susceptible to their absorbing influence and alienating us from the beautiful.

But pardon this digression in blending the useful with the beautiful. Flowers being my theme, let us review their status: Old as humanity; broad as the universe in their adaptation; deep beyond expression in the affections of our people; high as the flight of imagination can describe in their chastity, innocence, beauty and fragrance; emblematic of Heaven's best gift in their refreshing mission to the sick and suffering; enjoyable alike by the monarch and lowly peasant; poets and writers of all ages have vied in the lavish description of their charms and influence; enjoyable alike in all states and conditions of life without any reaction of feeling; expressive of human affection at births, marriages and deaths; woven in the victor's wreath; flung as grateful tributes to valor, to patriot, statesman, or orator, who is able to captivate by deeds of daring, or thrill with eloquence; talisman of love and sincerity to youth and maiden; pleasing and refreshing reminiscences to maturity and age; to all, refining and inspiring, breathing delightful perfumes, floating like rich incense o'er the earth, soothing human sorrow, exalting and ennobling character, touching a responsive chord in humanity, to the Giver of all good for those types of divine beneficence—surely such qualities ought to awake a vibrating chord of love, sympathy and devotion in every recipient heart, as it did in Scotland's greatest lyric poet to the modest mountain daisy

Wee modest crimson-tipped flower,
Thou's met me in an evil hour
For I maun crush amang the stoure
Thy slender stem
To spare thee now is past my power,
Thou bonnie gem.

The SECRETARY : What flowers are the most satisfactory in your garden ?

Mr. ROBSON : I think the rose is the king of flowers.

The PRESIDENT : Mr. Beall, let us hear from you on this subject.

Mr. BEALL : I have a number of hybrid roses, we have no difficulty in keeping them. All I could say would be to encourage hybrid roses instead of the common summer roses, because there is scarcely more difficulty in growing one than the other, and it is pleasant to have roses when every other person's have gone. We always have roses until the snow comes. In winter we lay them down, put a piece of wood on them, or some cedar brush, or something of that kind.

The SECRETARY : You cannot grow La France rose in Lindsay out of doors ?

Mr. BEALL : No, I have not succeeded in doing it. I don't think there would be any difficulty if special care were taken to protect the roots. I don't care for growing anything that requires extra pains ; it doesn't pay. There is no difficulty in growing and protecting the hybrid roses.

The SECRETARY : Can you mention the one that has given you the greatest satisfaction last year ?

Mr. BEALL : The one that has given me the greatest satisfaction every year is the Lena Turner. It is beautiful in shape, and in the conformation of its petals, and it has a very fine flower. Its greatest beauty is it is constantly in bloom. We can always find a rose on that bush. The color is very bright, but rather of a deep pink. I sent some buds to Dr. Beadle and Mr. Mitchell, but I never heard that they have been successful in propagating them, and I cannot find it in any catalogue now. I believe it was from Dr. Beadle I got it, perhaps 25 years ago, and I am very anxious about the matter because the old bush is getting weaker.

Mr. MCNEIL : What is your method of pruning roses ?

Mr. BEALL : We never touch them in the fall of the year. Bend all down ; high branches will shoot up four or five feet high. Those are all laid down in the winter. In the spring we leave no shoot more than a foot or a foot and a half high.

The SECRETARY : Do your summer prune ?

Mr. BEALL : No, of course we occasionally cut out old wood. I would pay ten or twenty times the price for the Lena Turner that I would for any other, for the great satisfaction of blooming the whole summer long. I recollect one year we had fine beautiful roses on one branch in November. Of course we hadn't very much frost before that.

Dr. BEADLE : I have tried several times this last eight or ten years, and I cannot get it—cannot find anybody who is growing it.

Mr. RACE : Would you recommend confinement to a few varieties ?

Mr. BEALL : I would recommend every person to grow all he can find room for. The more that are grown the better for the family and for everybody else. I would certainly choose the varieties that would bloom the best. I have a great deal of satisfaction with the old Jules Margottin.

Mr. RACE : Have you Jules Margottin growing on its own roots ?

Mr. BEALL : No they are all budded roses. I would not take the trouble with a rose growing on its own roots, because I can't find any person that keeps them more than two or three years. I want it to last as long as I do. I don't think any man can find a better rose than the old John Hopper. I believe that is the very first produced in England—one of the very first at all events—and I don't know of any better rose to-day.

Mr. EDWARDS : Would you give some roses that could be grown successfully here ?

Mr. BEALL : We like the Camille de Rohan. I have the Marshall P. Wilder, but it does not suit me at all—it is a great big coarse rose. Caroline de San Sal I don't care much for. The Baron de Rothschild and Gen. Washington are good roses. The latter is not double enough, but it is a very fine rose, and of good color.

SECOND DAY—MORNING SESSION.

The President: It is usual to have our financial report submitted as early in the session as possible. I will ask the Treasurer to read his report, and then the Auditors to present theirs.

FINANCIAL STATEMENT.

Mr. Woolverton read his report as Treasurer as follows:

TREASURER'S REPORT FOR THE YEAR 1892-3.

RECEIPTS.	$ cts.	EXPENDITURE.	$ cts.
Balance on hand	153 78	Canadian Horticulturist	1613 98
Members' fees	2123 89	Salary, Secretary, Editor and Clerk.	1200 00
Government Grant	1800 00	Chromo lithographs	339 56
Advertisements	294 87	Directors' expenses	192 07
Bound volumes and binding	48 80	Commission	186 18
Back numbers etc.	8 16	Express and duty	175 52
		Plant distribution	118 58
		Postage and telegrams	107 33
		Printing and stationery	94 08
		Stenographer	66 26
		Electrotypes	55 65
		Book binding	54 92
		Discount	23 74
		Committees	23 44
		Auditors	20 00
		Care of rooms at meetings	5 00
		Russian exchange	3 60
		Petty cash	1 50
		Balance on hand	148 21
	$4429 00		$4429 00

We, the undersigned Auditors, having examined the various books and accounts kept by your Secretary-Treasurer and carefully compared them with the vouchers, have pleasure in bearing to their correctness, and the careful manner in which the books have been kept.

L. E. Edwards, F. G. H. Pattison, Auditors.

Dated December 6th, 1893.

Mr. Edwards read the report of the Auditors as appended to the Treasurer's report and added: I have much pleasure in emphasizing the fact stated in the report as to not merely the correctness, but the satisfactory way in which the accounts are kept. This is the first year in which I have been Auditor, and it has given me a very great pleasure to see the thorough and systematic way in which all the accounts are kept, enabling the Auditors to complete their work with satisfaction to themselves, and I hope, also to the Association. I have much pleasure in moving the adoption of the Treasurer's report as audited.

Mr. F. G. H. Pattison seconded the motion, and as the second auditor endorsed Mr Edwards' remarks as to the correctness and neatness with which the books were kept.

The motion was put and carried.

The President: It has been our custom to proceed with the election of officers the second day, and although the programme says this would be done on the last day, I think it would be better to continue our custom, as we have always a full meeting the second day.

Mr. Race: Would that require a motion?

The President: I think it would, because I think there is a motion to the contrary; is there not, Mr. Secretary?

The SECRETARY : Yes. the reason the programme mentions the elections as taking place on the last day is that at Brantford the opinion was expressed that this would be better as the members would be better acquainted with one another and more able to judge who were fitted for the various offices. I presume, however, that we are pretty well acquainted with one another by this time. I have no objection myself.

Mr. RACE : After due consideration last night by the Executive it was decided to submit the question to the meeting this morning whether we had better depart from the arrangement of last year and go on with the elections this morning. I would move that the election of officers be proceeded with this morning.

Mr. SMITH seconded the motion.

Mr. BEALL : I would like to ask Mr. Edwards if this would make any difference to the people here. Are there any considerable number who had intended to be here at the election of officers ?

Mr. EDWARDS : No, I don't think so. I am sure it was not the intention of the people of the County of Peterboro' to come in and swamp the meeting in connection with the elections. (Laughter.)

The SECRETARY : The reason I gave last night to the Directors for proceeding at once with the election was that the new officers ought to get together before they leave the Convention and lay plans for work, and go home feeling that they know what they are going to try to carry out during the year.

The motion was put and carried.

The PRESIDENT named Messrs. Alex. McNeil of Windsor and T. M. Grover of Norwood to act on the Nominating Committee. The three chosen by the meeting were : Messrs. Turner of Cornwall, M. Pettit of Winona, and Dr. Beadle of Toronto.

REPORT OF COMMITTEE ON FRUIT EXHIBITS.

While the Nominating Committee were at work, Prof. Craig reported for the Fruit Committee. He said : You will be interested to recognize your old friend, Ben Davis, from British Columbia. Grown in that genial climate it takes on quite a handsome appearance. I think the limits of improvement are comparatively narrow in the Ben Davis, though in its home it is very much better than we can grow it in Ontario. An interesting little apple, to which I may draw your attention later in the report on new fruits, is this Pomme de Fer, literally the Iron apple, which originated in the Province of Quebec. It is a small dark red apple, and keeps easily till June. From Mr. Robson of Lindsay. We now come to an interesting exhibit of W. H. Dempsey, the fruit of the labors of the late P. C. Dempsey, so long known in connection with our Society. This consists of apples all raised from the seed of the Northern Spy and crossed with the Golden Russet, and exhibits very well the work we may expect when we go into the work of hybridization. Another interesting cross is the cross of the Duchess pear with the Sheldon ; and this is the product. You see the progeny resembles the Sheldon considerably, and it has the same characteristic—gritty flesh—of the Sheldon, only more intensified I think. There are large gritty granules about the core of this that depreciates the quality considerably. Showing how apples may be preserved, we have specimens from Mr. Beall of Lindsay of the Lawrence. These apples are part of the crop of 1892, and are in perfect eating condition. They were kept in an ordinary cellar without more than ordinary precautions. (The Professor here showed by illustrations taken from the table the advantages of cultivation, one apple having been grown in an old pasture and the other having received high cultivation. Both were of the same variety, yet the latter was twice as large as the former.) The report was then read as follows :

Exhibit of selected fruit by the Secretary : Gilpin ; Jonathan from Quebec ; Blenheim, Ontario ; Æsopus' Spitzenburg, British Columbia ; Newell, from Wisconsin—a flattish green apple, keeps till May ; Ben Davis, British Columbia, large, fine colored ; Ben Davis, Quebec ; Longfield ; Wealthy, Ontario ; Canada Red ; Pomme de Fer.

Mr. Robson showed Agawam Grapes ; Fameuse, an extra good plate without scab or spot ; Josephine de Malines ; Fallawater.

J. H. Toole, Orillia, exhibited La Rue, Hurlbut, Fisher, Pewaukee, very fine specimens, well colored ; Ben Davis ; Mr. Leaf, Colvert, very green ; Golden Russet ; Mr. Toole, Pomme Grise ; Mr. Gillet, Wealthy and Fallawater ; Mr. Willis, Talman Sweet ; Ribston Pippin ; Belmont, by Mr. Willis.

Exhibit of Hybrids by W. H. Dempsey . No. 80, cross of Golden Russet and Spy, large oblate crimson with light dots, calyx closed basin moderately large, round, regular, stem $\frac{1}{2}$ to $\frac{3}{4}$ inch long ; cavity, deep, narrow, russeted ; flesh, yellowish white, firm, crisp, juicy ; acid, quality fair. Mr. Demspey says tree is a fair grower and apparently a fair bearer. Walter—same origin as last—large, round, or oblong, yellow ground overlaid with splashes and stripes of light and deep red ; calyx, closed deep ; stem slender set in a deep, narrow cavity ; flesh, white, soft, melting core, very small ; quality only fair at this date, though now past its best, a handsome apple.

Same origin as last. Medium to small, round, dark crimson ; flesh, firm, woody sub acid, not promising.

Seedling apple W. H. Dempsey, medium to small, round, dark crimson . quality, not to be commended.

Pear, cross of Duchess and Sheldon ; about same size and appearance of Sheldon flesh, peculiarly granular about the core, very interesting as the product of hybridization but hardly valuable from a commercial standpoint.

Lawyer, exhibited by Thos. Beall, Lindsay, in good condition. Remarkable from the fact that it is from the crop of 1892, showing great keeping qualities. Vale Mascal Pearmain also Ontario.

Seedling, grown by F. Crandall, medium size, flattish, greenish, and believed by your committee to be Belmont.

By T. H. Race, Mitchell, Ont., large handsome, apple, has been called Spanish Pippin, resembling Spy in appearance, but poor in quality.

By A. M. Smith, Lawrence pear, Keiffer pear, Princess Louise apple.

G. W. Cline, Keiffer pear.

By W. S. Turner, Cornwall, Shiawassie Beauty, Golden Russett, Scott's Winter, Bourrassa, Northern Spy, McIntosh Red, Fallawater, Ben Davis,

E. B. Edwards, Blenheim Pippin, Canada Red, Northern Spy.

Mr. McGibbon : La Rue, Roxberry Russet, Northern Spy, Ben Davis, Fallawater, Ben Davis.

The Secretary moved the adoption of the report, Mr. Beall seconded it. Carried.

JOHN CRAIG,
Chairman.

REPORT OF NOMINATING COMMITTEE.

Mr. PETTIT read the report of the Committee on Nominations, and moved, seconded by Mr. Smith, its adoption, which was carried. The full list appears on page 2.

A COMPLIMENT TO THE RETIRING PRESIDENT.

Mr. BOULTER : I think it was the proper thing for the Ontario Government to make preparations to have the fruit growers of this Province properly represented at the Worlds' Fair, and I believe their choice of a representative was a wise one. I wish to move :

"That the thanks of this Association are due and hereby tendered to our retiring President for the action that he took whilst representing Ontario's fruit interests at the World's Fair in placing our exhibit to such advantage."

From personal observation during a month's visit to the Fair, I know the choice was well made, and that our representative tried to do his duty. You all, as patriotic Canadians, felt your blood tingle when you knew what Canada had done at that World's Fair. Americans who thought we had a cold country that could produce nothing, found that we can compete with them in any products almost, we may say. To-day we stand on record as one of the greatest fruit producing countries on this continent. Our apples have ranked five shillings a barrel higher in the British market than any to the south of us, and I believe to-day they will rank higher than ever. Outside of the national view, I believe we will be benefited financially by the exhibit we made at Chicago.

Mr. CASTON suggested that this matter be deferred till the new President took the chair.

The PRESIDENT : I will now ask our friend Mr. Race to come forward and take the Presidency of this Association. I thank you, gentlemen, most sincerely for the cordial manner in which you have supported every effort of mine as your President during the last two years. In leaving the chair I feel that I am parting with gentlemen who have done everything in their power to advance the interests of the fruit-growers of this Province, and in every act of mine I have received their support and advice in every respect. I ask you, gentlemen, to tender that same courtesy and kindness to our new President, who will now take the chair. I have much pleasure in introducing Mr. Race, the President elect.

Mr. RACE : I am sure, gentlemen, that I thank you very heartily for the position in which you have placed me here to-day. I may justly boast that I am the first newspaper man who has ever occupied this position, and I also boast the honor of being the only newspaper man who has been, or is at the present time, the President of a Farmers' Institute in Ontario. I have had a great interest all my life in agricultural matters, and I am still as deeply interested as I ever was in horticultural matters. I believe I am becoming more enthusiastic year after year. Sometimes we imagine there are too many professional men introduced into this sort of thing, but as long as a man is a professional man and at the same time a practical man, I think probably the two qualify him better than one who is only giving one side to a question. I take the theoretical side of this, and I also do a good deal on the practical side. I do a great deal of work in connection with horticulture. I have to do so. I am generally up pretty early in the morning in the summer time working among the fruit and flowers I trust I may do honor to the position you have conferred upon me. I am heartily in accord with the sentiments expressed in regard to the ex-President. We thought he was a man so eminently qualified for the position and the duties that were going to devolve upon the the President at Chicago, that we thought he was the right man to keep a second term in office, although it was contrary to precedent ; and I trust I may be able to fill the duties as satisfactorily. It shall ever be my endeavor to do so. You have heard the resolution that has been proposed by Mr. Boulter, that the thanks of this meeting be tendered the retiring President for the very efficient manner in which he has filled the chair, and for the manner in which he has performed the onerous duties that devolved upon him in connection with the Ontario fruit exhibit at the World's Fair.

Mr. CASTON : I take great pleasure in seconding the motion. I think we would be lacking very much in our duty as fruit growers if we failed to express our appreciation of the remarkable success that has attended the labors of our President as Commissioner for Ontario at the World's Fair. I think we are all proud of the success that Ontario has achieved there ; I think it will be more profitable for the Province than all the immigration agents that we could send out. In the selection of the Commissioner, the right man was put in the right place, and we owe our gratitude first to the Government, secondly to Mr. Awrey, and last to our ex-President, who has so ably filled the duties. It required a man who was thoroughly conversant with the capabilities of Ontario—a man of energy ; and above all, a man with a great amount of executive ability. All these qualities we had in our ex-President. We ought to be proud of the

position our Province has taken at Chicago—due in the greatest measure to the ability of our representative. I doubt if we could have got any man who would have filled the position better, and we are only doing our simple duty in recognizing his work. I do not forget our Secretary either. We all know him, and know what kind of a man he is. Of course he was not so directly connected with our provincial exhibit, being a Dominion officer; but we know he would not be dallying around the Midway Plaisance instead of attending to his duties. (Laughter).

The motion was put and carried amid applause.

The PRESIDENT: I have great pleasure, Mr. Retiring President, in extending to you the vote of thanks of this Association for the very efficient manner in which you have performed all the duties that have devolved upon you during the past year.

Ex-President PETTIT: Gentlemen, I am sorry it is just this time of day. (It was nearly noon). I would like, in reply to this resolution that has been so kindly tendered me, to present a very short address as the President's Address, in which I trust I would be able to embody what I would like to say to you on this resolution. If you could bear with me for ten or fifteen minutes I would do so. (For this address see page 5.)

Mr. PETTIT continued: I would like to say a little more on this subject. I have spent the last six months with men engaged in the same work as myself, fighting, with every energy possible, to win for our Province that credit that she ought to have. Every State was doing the same; and yet we met as men together on the most friendly terms, and the six months were the happiest I ever spent. From the day I entered that building till the day I left, I never heard one word unkindly spoken between us. You will not often see that at large exhibitions of this kind. Another feature of the case was this: We had men from the finest fruit states of the Union as judges; every man was a foreigner, and I believe the verdict he rendered for Ontario was a true one. I believe it was rendered in the best of his judgment; and instead of looking as we do sometimes to the other side as being in advance of us in fruit culture, and as our pattern in other respects, I say, gentlemen, they want to look to Ontario for their pattern. (Hear, hear, and applause). Trace it where you will throughout Ontario's exhibits at the World's Fair,—I care not whether it is in agriculture, in stock, in fruit growing, or any other branch of industry—and you will find she stands at the head of almost any other country that exhibited there. (Applause). They have difficulties to overcome in our neighboring states, they are not placed in a happy position anywhere to-day; in many respects, they are far from markets. They have greater distances to reach the markets of the old world, that we have convenient to us; and I do not believe their agriculture is equal to our own. Look in the matter of cheese. We have heard of the United States being the great cheese country of the world. How is it with us to-day? We went there in the spring of the year, and out of 134 awards offered to the whole world in the cheese industry, Ontario took 125 of those prizes. (Applause). Americans said afterwards they thought Ontario was a little slow because she didn't take the other nine. (Laughter). The only reason she didn't take the other nine was that she was just shown nine cheeses. (Laughter). We had another exhibit to make in the fall of the year, collected from all parts of Ontario; and what did Ontario receive there? Ontario received 99 per cent. on cheese at the fall exhibit. (Applause). In our horticultural department what did we do? The awards were not all out when I came away, but I know we have awards innumerable in our fruits. How did we get them? These awards were decided by weights, and our weights were ahead of other countries. We also got another award for our style—the nice way in which Ontario's exhibit was placed. We got an award there which but one other State in the Union got. Then we have got numerous awards in our educational exhibit; and we have got one award which I think is a credit to the Province of Ontario—a credit to our country in every sense of the word, we received a national award for our system of education. (Applause). Could we ask more than what I have mentioned? I say it is enough to make a Canadian prouder and prouder every day of his life. I was proud of my country when I went there; I am prouder of it to-day, because we have the people, the country, the soil, the climate that will produce better than any other climate in the world. Here is an advantage for our fruit growers

to look at ; the fruits of many countries ripen at a season of the year when the weather is too warm. We are thousands of miles nearer to the foreign market, our fruit ripens at a later season of the year our apple crop—the great staple crop to benefit our country—ripens later ; and those fruits can be placed in the markets of the world very much earlier, and I would not be surprised to see a great many of our American friends writing back to us to supply their winter trade. I visited a large number of the cold-storage warehouses in Chicago, and I found a large quantity of their apples were Canadian. They got them for late keepers because they could not hold their own. I believe there are very few parts of this Province that cannot produce apples of the very best quality, every locality can produce some quality in far greater excellence than other localities. If you want certain choice varieties you have to go to the northern part ; if you want other varieties you have to go to the south. We are capable of producing varieties that will supply the world for nine months in the year. When we see our grain product over-abundant, at prices too low to be profitable to the farmers of this country, cannot we wisely increase our product in some other line, as we are doing in cheese—as I believe we will do in butter before long and connect with them the fruit—the apple—industry as well ? Further than that : I think our manufactured product in the fruit line should be pushed more than it is. I had a conversation with a German from Hamburg, in Chicago. He comes out to this country every year to purchase large supplies of provisions for Hamburg. He says there is a grand opening in that country for our apple crop. He looked over our apples and said : "That is the stock we want, and we want large quantities of it, and I will be glad to open up communication with you." The Government of this country is sending Mr. Robertson—perhaps the greatest authority we have in our country on butter and cheese—to speak on the subject in Britain, and they have made a mammoth cheese to be drawn from one end of the country to the other. I believe the butter industry will receive the same attention I believe if Mr. Robertson would take our fruits also, and advocate them in Germany and other countries, we would greatly widen our market, and instead of curtailing the production of fruit in this country we would increase it largely, for we have the market that will bear a large increase with profits to the producer. Now, gentlemen, I thank you most heartily for that resolution you have passed. I appreciate most fully the words you have expressed ; but I appreciated your assistance the more when I was in Chicago. I felt there that I was to fight your battle, and without your assistance at home I could do very little ; but it was that assistance you gave me, and your liberality in your contributions and selections, that took the world's prizes—not my work ; and that gave me thanks louder than anything else I have received at your hands I was proud I was connected with that institution ; I was proud that I had the privilege of being your representative there ; and any man who goes forward out of this country to represent the people of this Province or of Canada in a competition like that, with the world, can truly rely that he has behind him the best and foremost race of people in the agricultural, horticultural, or any other field, that will stand up for our country and place it where it is destined to stand—at the head of any other country of the earth. (Great applause)

The PRESIDENT : I know, gentlemen, that you have all listened with a very great deal of pleasure and interest, and I believe a great deal of profit, to the remarks which have been made by the retiring President. I do not think it would be well to emphasize those remarks, or to repeat them, lest we might, like Alexander of old, begin to smite ourselves in the side that we have no more worlds to conquer in that line. (Laughter). I have had an increasing hope and expectation for the last two or three years that what Ontario has won for herself in the way of cheese, she was also likely to win in the near future for her apples ; for I am fully convinced from my own observations in this country and in the States of the Union, that there is not another apple produced on the continent equal to this one that we produce here in Ontario. It is not necessary to ask for any expressions of opinion on any remarks on this address. I think you are all ready to receive it, and to express your gratification in the manner that you have done ; and as it is now time to adjourn, probably we had better adjourn till, say, two o'clock.

Mr. SMITH : Could we spare about five minutes longer while we are on this business ?

The PRESIDENT : I think so.

Mr. SMITH : While I am fully in sympathy with all that has been said and done in regard to the work of our late President, I think we ought not to forget that we have another member of our Association who has taken a very prominent part in that work, although not a representative of our Fruit Growers' Association. We all know the part that our esteemed Secretary has taken there ; and although he has not been working as directly for Ontario, he has been working for Canada, of which Ontario is only a part. (Applause). We are one country, and I think the honors of Ontario and Canada ought to be equally divided ; they ought to be identified : and I have much pleasure in moving a vote of thanks to our Secretary, as an appreciation of his labors at the World's Fair during the past summer. I know something of the labors that he performed there, having been with him a few weeks, and I think this vote of thanks is but his due.

Mr. A. H. PETTIT : I have much pleasure in seconding that motion. I can assure you that I saw the great work the Secretary was doing for this country of ours at the World's Fair I did not wish to refer to that department, or to trample upon his territory, as I wished him to have an opportunity of expressing himself more fully in that line.

Mr. EDWARDS : As one who was present at the Fair, and saw the splendid exhibit of Canada as a whole and of Ontario in particular, and observed the excellent work of the Secretary as well as the ex-President, I wish to add my expression of appreciation of the work that has been done. I think it is fortunate for Ontario that she had not merely our ex-President as the director of the Ontario exhibit, but that she had our Secretary as the chief director of the whole exhibit for Canada ; and I think it is a matter of which we have reason to be proud, that our two officers were the chief men in our Province and in our Dominion respectively.

The motion was put and carried heartily.

The SECRETARY, in responding said : If there were time I would be very glad to reply at some length to your very kind motion, because there are a great many points which I believe would be interesting to you, which I might bring before you. However, I hope that I shall have opportunity in other ways to give you those points so that you may read them, and it is not necessary for me to take up time here to place them before you at this late hour. But I do wish to most heartily thank the Association for their great kindness to me in the indulgence which has been shown me by the directors and members of this Association, because I fully understand my position as its servant ; and in taking up the work that I did at Chicago I had necessarily to give less time and attention to the work of the Association during the last year I feel this. However, I may say that I did not lose sight of your interests and the interests of Ontario while looking after the interests of Canada as a whole. With regard to our own Association, I felt proud to make an exhibit of the literature which has been published by it during the past years ; and our fourteen volumes of the *Canadian Horticulturist*, and our bound Reports showing work during so many years past, were placed before the judges at Chicago, and I am happy to tell you received a diploma and a medal for their merits as literature in the Department of Horticulture. I would like to add my testimony to what Mr. Pettit has said as to the noble place the Province of Ontario has taken at the Fair. We had some 7,500 square feet in the Horticultural Building devoted to Canada. Of this more than half was occupied by the Province of Ontario. (Applause.) So prominent was the Province of Ontario in all the exhibits that I had to fight for Canada to make it appear as important in the eyes of the world as the Province of Ontario. (Laughter.) Ontario made such a noble exhibit, and was so well brought before the public, that it might almost be looked upon as a separate nation. Indeed, I noticed, in one of the American papers a reference to the great nations of the earth which were exhibiting at Chicago, and it gave the list in some such way as this : Great Britain, Germany, France and Ontario. (Laughter.) We certainly have reason to feel proud of the number of awards taken by our Province. Out of sixty-six awards made to Canada for the various exhibits, and to the Provinces, Ontario has taken about two-thirds. There were several additional awards which I can speak of that are not included in Mr. Pettit's list because the individuals who exhibited sent their exhibits through

the Dominion and not through the Province of Ontario. One of these is our esteemed friend Mr. Boulter, who has taken an award for his exhibit of canned goods. There is one thing I would like to refer to with regard to the benefits to us. I think we stand a great deal higher in the estimation of the world than we did before the Fair —not only in the eyes of foreign nations across the water, but also in the eyes of our neighbors in the United States. You would be surprised at the prejudice that exists against Canada; and the "Yankees," as we call them, are more strong and more difficult to be convinced in regard to the resources of Canada and her people, than any other nation in the world. They lie here alongside of us, and they are jealous of us, and they are accustomed to belittle our importance; but when we went there with our exhibits, side by side with the exhibits of the various states of the Union, they had to admit that we excelled them in our apple products, and that we were a far more important country than they thought. Many of them would ask us, "Is it possible you grow these fruits? How finely colored they are! Surely you grow them under glass?" It was a constant source of astonishment to the thousands who walked through our courts, that we could produce such fruits under ordinary conditions in Canada. We proved to them what they were very slow to admit, indeed. I think results will be seen in the future, to our interest and general advantage. I am sure there is a market opening up in the west, and should it be, as seems probable, that the duty is to be taken off apples, and we should be able to put this fruit into the United States, I believe we shall find an increasing market for our apples on that side of the line. In Chicago the constant enquiry among commission men was for Canadian apples, and particularly our excellent Canadian Northern Spy—an apple that does not take so high a place, perhaps, in the English markets; but in the Western markets and Chicago the Canadian Northern Spy is the great apple in demand, and it will bring a very high price. I had enquiries from numerous large dealers in apples, not only from Chicago, but from States west, who were in the habit of ordering not only in carload lots, but tens and twenties of cars, asking about Canadian apples. At present the duty is almost prohibitive. Another thing: I believe we shall receive benefit in this Province in the way of colonization, and the kind of colonists that we want—not the kind that will be induced to go to the North-West Territories and so on, who have not perhaps a great deal of money, but the exhibition of what we can produce in the gardening line is likely to induce men of means to come to Canada. These are the men that we want in our older Provinces—men who will pay high prices for our land, and so make our lands more valuable. I believe this is not one of the least benefits to accrue to Ontario from the exhibits made at Chicago. (Hear, hear, and applause.)

SECOND DAY—AFTERNOON SESSION.

The Secretary: Perhaps everybody here does not know, as I do, that Mr. Beall has undertaken some work that I think is of considerable importance to us. At Lindsay he has been instrumental in forming a local horticultural society, which is affiliated with us; and this has worked so successfully there that Mr. Beall is inaugurating an undertaking to establish similar societies in adjoining towns and in other places. Now, if this scheme of Mr. Beall's works, it would be a very good one. Indeed, I think, if it could be extended throughout the whole of the Province, so that societies affiliated with ours could be formed under the Agriculture and Arts Act; it would be an advantage to them as well as to us, and should be considered more fully in all the towns in Ontario.

The President: When we adjourned we had no secretary for this Association. Since that time the directors of the Association have met, and the secretary *pro tem* will announce the result.

Mr. McNeill: At a meeting of the directors of the Association, called to order by the President, it was moved by Mr. Caston, seconded by Mr. A. M. Smith, that Mr. L. Woolverton, M.A., be continued as secretary of the Association and editor of the *Horticulturist* for the ensuing year at the same salary as last year. Carried unanimously.

The PRESIDENT: You hear the report; is that your pleasure?

Dr. BEADLE: We have no pleasure in the matter. That is entirely in the hands of the directors. (Laughter.)

The PRESIDENT: The directors did not really make the thing a final matter in that meeting.

Dr. BEADLE: It is final in the hands of the directors. The society has no power in the matter; you can report to the society what you have done, but they cannot help themselves.

The PRESIDENT was requested, by vote of the Convention, to appoint a Committee on Legislation.

The PRESIDENT: We have a paper here on "Raspberry Culture." I think, and some other of the directors think, that that would be a matter of interest to those who are present at this meeting, and we think well to call that question right on now.

RASPBERRY CULTIVATION FROM AN AMATEUR STANDPOINT.

Mr. R. B. WHYTE read the following paper: Before discussing methods of cultivation and varieties I would like to put in a plea for the more general cultivation of this the most delicious and in every way the most desirable of all small fruits. Only those who have grown them or have had the privilege of buying them freshly picked, have any idea of the delicate aroma and sweetness of the best of our cultivated raspberries, while in length of season, ease of cultivation and amount of crop for the space occupied, they have the advantage of any of the small fruits. By a proper selection of kinds you can have fresh berries on your table for five weeks or more, and the yield is so large and the cultivation so easy, that there is nothing to prevent any gardener—even though he has only a city lot—growing all that an ordinary family can use. No special soil is required; any ordinary friable soil is good enough so long as it is drained as well as it ought to be before being made into a garden, for though the raspberry will make good use of all the moisture that comes from above it is very impatient of stagnant water at the roots. Neither can you expect the best results if your soil is very sandy; so much water is required during the ripening season, that in a very dry and sandy soil the fruit is apt to be small and lacking in juiciness unless water is liberally supplied. The perfect soil is a heavy sandy loam that is fairly retentive of moisture and does not bake during hot weather.

By far the best time to plant is in the fall as soon as the leaves have dropped. Procure your plants from the nearest reliable nurseryman and as soon as received unpack and cover the roots with moist earth until ready to plant, do not expose them to the air any longer than is necessary. Exposure of the roots to the drying action of the wind and sun is the chief cause of plants failing to grow. Plant two to three feet apart five to seven feet between the rows according to the vigor of varieties. Weak growers like Brinckle's Orange do not require more than five feet, stronger growers like Cuthbert need six, while rampant growers like Shaffer require seven feet between the rows. Before the ground freezes cover with rotted stable manure one foot on each side and 3 or 4 inches thick.

During the next summer they do not require much attention. You can grow a crop of peas or beans between the rows if you like, but be sure and keep them free from weeds, cut off any laterals that may appear within two or three feet of the main cane, cut out any weak shoots and all suckers that you do not want; in the fall cut back the main canes to 4 or 5 feet high according to their vigor, mulch with manure as when planted and bend them down as close to the ground as possible, putting on them pieces of board or scantling or anything heavy enough to keep them under the snow. No other protection is necessary even for the most tender varieties.

During the second and each succeeding season the treatment is the same. As soon as the frost is out of the ground I remove the covering and tie the canes to stakes driven about a foot into the ground close to the plant. I find the cheapest and most convenient

stakes can be made from what is calling "furring" 1½ x 2 in., used to nail lath to in house building, cut into 6 ft. lengths and pointed, the most satisfactory tying materi l is a cheap, soft, jute twine. When tied up spread the mulch between the rows and lightly fork it under. Never use a spade. The roots are so close to the surface that they are very much injured if spaded. To keep down weeds and suckers I use a Planet Junior double wheel hoe which reduces the labor of weeding to a minimum. For a small garden a very good substitute is a "Crescent hoe"—an improved form of the Dutch hoe—sharpened on convex and concave sides so that it cuts equally well both ways.

As soon as possible after the fruit is picked cut out all the old wood and surplus canes, leaving four to six to each hill, tie them loosely to the stake to prevent their being broken by high wind, and no further attention is required till the autumn. When the leaves fall I go over the rows cutting back all branches to six inches long and the main canes at five feet; they are now ready to be laid down for the winter.

This is the system of pruning I have practiced for fifteen years and am every year more convinced that it is the correct one for our climate. There is no variety that I have grown so hardy that it does not winter-kill more or less during our severe winters and sometimes to the snow line, ruining the crop for that year. The only safe course is to lay them down, and to do that they must be grown long and limber so that they can be easily bent. Another advantage of long canes is that the fruit being higher up on the plant it is not so liable to be soiled by the rain splattering the earth on it. It is also much more easily picked than if on a low growing branching bush, and being better exposed to the sun and air, they are finer flavored. When picking for immediate consumption I always take those along the top of the rows, finding them much sweeter and richer than when protected from the sun's rays by the leaves

The question of what is the best raspberry to grow is a very difficult one to answer. So much depends upon conditions of climate, exposure and individual preferences that it is impossible to say of any one variety that it is the best one to grow under all circumstances.

During the last fifteen years I have grown over 20 named varieties and have fruited 21 seedlings of my own. Out of the named kinds I have kept 8, though not all of equal merit, yet as having all some points of excellence about them that make me reluctant to part with any of them. Before discussing what I consider the eight best sorts for amateur cultivation, it may not be uninteresting if I give you a brief account of those I have discarded and in what respect they fell short of my standard. My raspberry experience began with the Clark and Franconia.

The Clark is a large, sweet, juicy berry in quality, the very berry for home use; but with me it was too shy a bearer, not a vigorous grower, and was supplanted by other varieties as good in quality and more productive.

Franconia is a large, fine-colored, well flavored berry and a very heavy bearer. I think it produced as much fruit as any berry I ever grew, and would be a very profitable berry to grow for a near market, but for the amateur to whom quality is the first consideration, it has the serious fault of having a very large seed, still it had so many good points that I discarded it with considerable reluctance.

Crimson Beauty I procured specimens of from the introducer, but two years sufficed to show its worthlessness. Neither in size, quality or productiveness was it superior to our wild berry.

The Philadelphia at one time a very popular variety, and which is still grown somewhat extensively for market, fell far below my standard in size, color and quality. It is a very heavy bearer of small dark colored, poor-flavored berries quite unworthy of a place in the amateur garden.

The Hansell is a an early medium sized, fair quality, but with me was too shy a bearer to be worth keeping.

The Marlborough is a very large, bright-colored early berry, and I have no doubt a very profitable variety to grow for market but is the poorest-flavored berry I have grown, being altogether too insipid to be worthy of a place in the amateur's collection.

About the Turner as a fruit I can say nothing, but with it as a plant my experience is so singular that I will give it to you in the hope that some of you may be able to

account for the phenomenon. Five years ago I procured 20 plants from a well-known nursery firm, they made a good healthy growth the first season. In the spring there was a fine show of blossoms but no fruit set. Thinking that probably some peculiarity of the season was the cause I gave them every care and the following spring had the finest-looking row of plants I ever grew—a magnificient show of foliage and blossoms, but not a solitary berry did I get. I would very much like to know if any one else has had a similar experience and how they accounted for it.

Everbearing berries is the name given to some varieties that in addition to the usual summer crop fruit again in the autumn. I got some plants from a friend near Montreal under the name of "Everbearing Red." I found that the summer crop was a very small one, and that we never got more than a few scattering berries in the fall, as they were always caught by early frosts before they had time to ripen. They might be a success farther south, but with us in eastern Ontario they are valueless.

Saunders' Hybrid sent out by our Association in 1880 is a hybrid between a red raspberry and a black cap; Johnson's Sweet possessing some of the characteristics of both types, the softness and juiciness of the Reds with the flavor and habit of growth of the cap berry. I fruited it for several years, but though very satisfactory in productiveness and quality it was eventually supplanted by the Shaffer of the same type but much larger.

My experience with the black cap family is limited to the Mammoth Cluster, Tyler, Gregg and Hilborn. The first three I have discarded, but still retain the Hilborn and will refer to it later.

The Mammoth Cluster at one time the most famous berry of the class is now very little grown, having been supplanted by others of doubtful superiority.

The Tyler is a very early, good flavored, fairly productive berry but too small, in no way superior to the *Rubus occidentalis* of our woods.

The Gregg is much larger than Tyler but inferior to it in flavor and productiveness. I never could get a paying crop from it. Indeed it is doubtful if any of the cap berries are productive enough to be worth growing in a small garden.

In my collection of what I consider the 8 best raspberries and none of which I would like to part with are three reds—Cuthbert, Herstine and Hebner; three yellows—Golden Queen, Brinkle Orange and Caroline; one black cap, the Hilborn, and one Purple Hybrid Shaffer.

Of the reds the best-known and I believe the most extensively cultivated of all rasps is the Cuthbert, well-known to all raspberry growers, a large, fine flavored, firm berry, very productive, holding on well to the receptacle, therefore not apt to drop till picked, a combination of good points that make it one of the best for amateur cultivation and the best of all for market. It is the only red raspberry that reaches our Ottawa fruit stores in good condition, looking fresh and attractive, while Philadelphia shipped at the same time looks sodden and mouldy with the boxes not more than three-quarters full.

The Herstine is too soft for a market berry, but for home use I prefer it to the Cuthbert. It is a very large, fine-colored, sweet and juicy berry which I have grown with great satisfaction for ten years and have yet to see a fault in it.

The Hebner which I got from my friend, Mr. W. W. Hilborn, five years ago—and who, I believe, controls it—is a very fine berry of the same type as the Herstine, as large and juicy, rather finer flavored and I think more productive—for amateur cultivation upon the whole the best red raspberry I know of, it and the Herstine ripen about the same time a week before Cuthbert.

If growing only one yellow I would take the Golden Queen, sometimes called a yellow Cuthbert—hardly so vigorous a grower—but otherwise very like it, except in color, which is a very pretty pale yellow. Its only competitor for first place among yellow is Brinkle's Orange which is considered by most raspberry growers to be the finest flavored of all rasps, and it is undoubtedly a most delicious fruit, large and very handsome but unfortunately too delicate in constitution to stand the extremes of our climate. It can, therefore, only be grown with great care, and even with the best management they are sometimes winter killed. In texture it is too soft, except for home use, but freshly picked, with a suitable allowance of sugar and cream, there is nothing that I know of in the fruit line that can equal it.

Caroline does not compare in size or flavor with Golden Queen or Brinckle, but has some good points. It is an immense bearer of beautiful pinkish yellow berries of the black cap shape and type, and though not equal to Brinckle in flavor is still very good.

The Hilborn, the only black cap in my collection, is considered to be one of the best of the class, but with me the fruit is too small and too dry to suit my taste. Like all the caps it is very short-lived and difficult to manage in a small garden I have had to renew my plants every three or four years, a serious drawback when space is valuable. The canes grow so stiff that they are difficult to lay down for winter and often break during the operation. Altogether I doubt if they can be profitably grown by the amateur. Indeed since the advent of the Purple Hybrids, their equals for canning, and very much their superiors for table use, it seems to me that their usefulness has departed.

The best of the Hybrids is the Shæffer, a large purple berry, very productive and vigorous. It is much liked by some for table use, but is rather too acid for my taste, Its color is also against it for that purpose, but as a canning berry it is unequalled. The canned fruit is of a beautiful dark reddish purple color, the seeds not near so prominent as in the canned black cap, and the flavor is much superior to any other berry that I know of.

In addition to these named varieties I have fruited 21 seedlings of my own during the last three years, five of them black caps, four of which proved worthless and were thrown out; the other, I think, will be worth propagating. The rest are all red, some of them of no value, but most of them very good, and a few of them of great excellence. Nos. 3, 6, 7, 13 and 17 I have propagated, and they are now on trial.

No. 17 is the largest raspberry I know of—too soft for shipping, but a very handsome berry and very productive.

No. 7 is also a very large berry—firm and bright-colored, with a very refreshing slightly acid flavor that has been much admired by those who have sampled it; foliage large and dark green, canes strong and vigorous.

No. 13 is also a very large, sweet-flavored, fine berry between 7 and 17 in firmness.

No. 6 resembles No. 7, is not quite so large, and differs from it it flavor.

No. 3 made a good showing on the original plant, but did not do so well last year when set out in the garden. It did not fertilize properly and some of the berries were imperfect. If it retains that defect the coming season I will discard it as there are too many good varieties in existence to perpetuate any others that are not equal or superior to the best of those now grown.

The seedlings here described appeared at different times as stray plants in various portions of my garden, probably from seeds of the cultivated varieties, but I am unable to give the exact parentage in any case. Mention is made of them here, with the object of creating a greater interest among fruit-growers in that most fascinating of all horticultural work, the production and development of new varieties.

The PRESIDENT: Now, we will allow a reasonable length of time for discussion.

Mr. WHYTE: I will be happy to answer any questions or reply to any criticism.

The SECRETARY: Will you tell us more about your method of pruning? It is quite different from what we adopt in the southern part of Ontario. We cut them short, two or three feet from the ground in the growing season, and you prune them up quite high with the object of laying them down?

Mr. WHYTE: The only sure way of getting a crop every year is to lay them down. A friend of mine told me he did not lay them down, and he lost every vine in the severe winter. I find no difficulty in bending a cane as thick as my finger if it is sufficiently long. We have every winter practically snow enough to cover them.

The PRESIDENT: You don't require to lay the Marlboro' down?

Mr. WHYTE: I laid it down.

The PRESIDENT: Up near Stratford we can bring the Marlboro' through the winters easily.

Mr. WHYTE: Are you subject to 30° below zero?

The PRESIDENT: No.

Mr. WHYTE: That fetches any of them.

The SECRETARY: Tell us when you do your pruning, and how?

Mr. WHYTE: As soon as the fruit is off, if there are any very rampant I prune them then. If you prune the new wood any way severely there is too much centre growth when the frost sets in in the fall. It is the last garden work I do, after my grape vines are pruned, to go through my rasberries and cut them back to five or six feet.

Mr. EDWARDS: Don't you prune them during the season at all?

Mr. WHYTE: No, not unless they are growing too rank. As a rule I don't meddle with the canes till the fall, and then I cut them all down to five or six feet, and cut off all the branches back to the main stem.

Mr. TURNER: Cornwall is not far from Ottawa not much difference in temperature; still one of our members—a Mr. Leitch—has his raspberries growing in hedge form; does not cut them down. He had a splendid crop this year—grows them four feet high.

Mr. WHYTE: There is this difference at Cornwall—they have the St. Lawrence river. Even though my Cuthberts would stand the winter without laying down, I would lay them down. I have left up plants, but I find those laid down fruit earlier.

The PRESIDENT: The Hillborn Black will stand 20° below zero.

Mr. WHYTE: I left half of my Hillborns up last season. The plant was not killed outright, but the tops of a great many branches were killed. I was more than ever satisfied that it paid to lay them down I have between 200 and 300 plants, and on a Saturday afternoon I can lay the whole lot down.

The PRESIDENT: Can any one in this immediate district give us any information?

Mr. GILES (Peterborough): I have quite a lot of Cuthberts and the black cap. I never lay them down. I have brought them through several years, and get a fair crop every year.

The SECRETARY: Have you compared the results where you laid them down and where you did not, in the same year, to see whether you got a better crop by laying them down?

Mr. GILES: I have never laid them down, but they have generally sprouted out most years right to the tip; not even the tip was affected to any great extent.

The PRESIDENT: What is your method of pruning?

Mr. GILES: Well, I prune the Gregg by the rules laid down in the *Horticulturist* and other papers, but the Cuthbert I did not prune at all—I just let them run for three or four years and then cut them down, and have a new plantation pretty much all the time.

Mr. SMITH: The cultivation of the plants affects their hardiness If you cultivate them late in the summer and keep up a tender growth they are liable to be injured in winter. If you give them good cultivation the fore part of the summer, keep the ground well stirred and get up a good growth, and then leave your ground alone and let them harden up, ripen up their wood toward autumn, they will stand the winter much better than if you keep cultivating till the snow comes.

Mr. HILBORN: I can corroborate what Mr. Smith says We have sometimes below 30° in our section, and we have never laid down the Cuthbert yet, and have a fair crop, by ceasing to cultivate early in autumn I think it is a very important point in a great many other things besides raspberries, to have the wood well made and hardened up before the cold weather comes If the plants are killed back a few inches, we cut that in the spring, and they throw out sufficient laterals to give a fair crop.

Mr. BOULTER: How late do you cultivate?

Mr. Hilborn: I never cultivate much after the middle of the summer. I make it a point to have the ground thoroughly clean, and then I don't put the cultivator in again that season; I don't touch them again till the spring; but I get in among them in the spring and encourage a good growth then. I always leave the old canes till the spring.

Mr. Stinson (Peterborough): I grow four raspberries—the Souhegan, the Gregg, the Shaffer and the Red Cuthbert. I don't prune the Gregg in the summer at all, and find I have better results; the others I prune down about two feet. The Souhegan I prune to get the branches. Last year my berries came through all right, but two years ago they killed badly, which was the general experience around here. The red raspberry I don't prune in the fall. In the spring I cut out the old wood, and if they are killed I cut back the cane as far as it is killed. Leaving the old wood on during winter protects the plant by allowing the snow to lodge.

Mr. Fisher, (Orillia): I grow Cuthbert and Caroline quite extensively. I don't do any cultivation of the Cuthberts after I finish picking. I consider that is one of the great secrets of the plant being hardy; next spring we cut out old timber. The Caroline will stand more frost than any other raspberry, and will bear more berries—at least at Orillia.

Mr. Turner: I don't see how these men can take a pride in a garden or a plot of ground of any description if they don't keep it clean. If there is anything I dislike to see, it is a dirty garden. These men can't grow raspberries that way without having a dirty garden; you must cultivate. The idea of these last two gentlemen saying they don't cultivate any after picking the fruit! It is ridiculous! Your garden is full of all kinds of weeds, and these weeds are going to seed. I am the greatest enemy of weeds, I don't allow a weed of any description to go to seed in my garden, summer or fall. I cultivate up to frost. I decidedly object to this idea of dirty gardening. I think both the last speakers are entirely wrong.

The President: May be these gentlemen do not consider simply hoeing out weeds to be cultivating.

Mr. Caston: I can assure Mr. Turner he is mistaken. He can come and see my garden, and this gentleman, too, in Orillia. The Cuthbert fruits pretty late with us, and by cultivating up to that time we can manage to keep our gardens perfectly clean. I can't account for it except that Cornwall is a very wicked place, and has a greater visitation of weeds. (Laughter).

Mr. A. H. Pettit: I want to go one better on the Cuthbert. I have seen the Cuthbert two seasons in Manitoba perfectly sound without being frozen back, and perfectly good crops. In August and September they usually have dry weather; the wood ripens and matures, and is not killed back; and there they certainly have lower temperature than we have here. So I think you will find the Cuthbert perfectly hardy under ordinary circumstances.

The President: Mr. Hilborn, will you tell us your experience?

Mr. Hilborn: My experience with raspberries has been that the pruning-back system has done the best. I don't quite agree with Mr. Whyte in the method of pruning, although I have seen his garden, and I must say that he has very fine raspberries, and he puts a good deal of work on his garden and has it perfectly clean and in good shape. At the same time, I think they can be grown more cheaply for market by the other system of pruning back, that is, the planter allows the canes to grow the first year until they are about a foot high, then pinches back, lets them branch out and does no more pruning till the following spring; then he cuts back any surplus wood. The second year he allows them to get about two feet high before pinching back. In pinching back you must be a little particular. If you take off too much of the tip of the new growth, the cane does not recover; it does not appear to make a good growth afterwards. If you take off the whole of the tip, it sends out the last lateral without branching out, and you miss the object in view. I would say, take off 4 to 6 inches of the cane when it comes to 2½ or 3 feet high, according to the age of the plant. Do no more pruning till

the following spring. Do the cultivation early in the season; start as soon as you can in the spring; keep down all suckers and weeds until about the end of the picking season, and after that allow the wood to ripen up.

Mr. ORR: Would you recommend fall plowing?

Mr. HILBORN: No, I think not, from my experience. Of course, that might be varied in some localities, but, on the whole, I would not like to touch the ground in the fall. You cannot do that without breaking more or less of the roots, and I like to leave all the roots without injury, as they retain the moisture which helps to sustain the life of the plant during winter.

The PRESIDENT: I think it would be well to understand that Mr. Hilborn is from the Lake Erie shore, and that the methods of cultivation there would not suit the season here.

The SECRETARY: Would Mr. Hilborn recommend the shortening system of pruning for cold sections, or wouldn't he consider that the laying down would be a better system?

Mr. HILBORN: That depends on the man. If a man will give careful attention, as Mr. Whyte does, laying down is the best; but the shortening-in system will work with an ordinary cultivator. More quarts can be grown at a less figure, take it as a whole, by growing in that way. My first experience was in Lambton County, quite a distance from the water; at present it is along the Lake Erie shore, and for a time I was at Ottawa. Taking it in all three sections, I think on the whole the shortening in principle will work best with the majority of people.

The PRESIDENT: I gave up the cutting-back system three years ago, and I find I can get a nicer berry, and have a bush that is easier to work among, by allowing it to grow right straight up, and not cut it off till the following spring. I also find you will get a nicer berry produced from the stalk than from the lateral that has been sent out the August before.

Mr. SMITH: Would not that involve the necessity of tying up the canes?

The PRESIDENT: Sometimes I drive a stick right down the centre and tie it to the stick; but my canes grow very high, and when I find that they are over high and I am afraid they will blow down in winter time I cut back in the fall. I always cut back to 4½ feet.

Mr. HILBORN: That is all right where the work is done properly, and those who give careful attention can succeed very well and get a finer quality of fruit grown in that way, but the great majority would give what we call only a slip-shod method of cultivation, and I think that is more easily done with the pinching in system.

Mr. WHYTE: The raspberries grown on the top of a plant exposed to the sun, have a very much finer flavor than those grown below the leaves. From the amateur's standpoint, quality is the first consideration rather than a large crop. Short pruning, therefore, is not suited for amateurs. I am surprised to hear that some growers do not cultivate after the crop has been picked. I would a great deal rather not grow raspberries than have my garden grow in the foul condition that it would be in. I don't understand about leaving them without pruning till the spring. Some of mine would be 12 feet high if I did not cut them back twice in the season. What an awkward thing to lay down!

Prof. CRAIG: Mr. Whyte has described the ideal method of growing raspberries for home use from the amateur standpoint. It is just a question for growers to decide whether or not they can be grown with profit on a large scale with the fine fruit that Mr. Whyte gets. In Wisconsin, a large grower, who grows 25 to 40 acres, lays down his plants every year, and finds it pays him to do it. In a series of experiments last year and the year before I found it paid me in this way, that the bushes laid down and covered, grown tall, as Mr. Whyte described it, were a week or ten days earlier than those not treated in that way, and were sufficiently more productive to pay for the cost of the labor. That is with all varieties rivalling in hardiness with the Cuthbert. I don't think with Hansell and Turner it paid me to do this, but with such varieties as Cuthbert, Hornet, Clark, and all that type, the results were very satisfactory.

Mr. BOULTER: I have 40 or 50 acres in raspberries. The Shaffer is not good for canning at the factory; it goes all to mush like the Cuthbert, and uses too much sugar; and we have discouraged it so much that this year there were at least 50 acres plowed up in Prince Edward county. I know to-day of 500 or 600 cases of Shaffers in tin cans, that were sent to Winnipeg at 20 cts. a dozen less than it cost to put them up. I would not spend money on raspberries that had not good flavor. If you go into raspberry culture for money-making, you must put them seven feet wide—even the Cuthbert. We pinch them off when they get about three feet high. Then the laterals start out. When we let the canes grow too long they weaken and freeze. We don't lay down the plants—too much labor; yet I have seen the thermometer down to —30°. We have lost them only one year. We cultivate with potato hoes. The Cuthbert is a different berry from the Shaffer—one grows from tips and the other from suckers. We put them about twelve inches apart, and in a couple of years we have the rows filled right up. We give them thorough cultivation about two weeks before the berries ripen. In the fall we plow, and throw the dirt well up to the bushes; that keeps them up so that they don't break down with the snow, and plow that around them in September thoroughly. Keep the manure from under the rows—they will draw all out three feet from the side all right. I believe strawberries also can be successfully grown. I paid a man $1,000 for what strawberries he brought me off three acres.

Mr. WHYTE: Stakes only cost 2½ cts. apiece, and they last four or five years. We have canned 25 or 30 cans, and it is the universal testimony that the Shaffer cans better than any other, and has a better flavor. I have not heard anything yet that has disturbed my opinion.

Mr. BOULTER: There is a difference between offering canned fruit to a guest, who is not going to be critical, and trying to sell it.

APPLES FOR THE FOREIGN MARKET.

The PRESIDENT: It has been suggested that we might discuss with profit to growers in this section, these questions; and I would call on Mr. Edwards to open the discussion:

Q. What three varieties of apples should we grow for the British market? One early winter, one mid-winter, and one late keeper.

Q. Are there any other good markets for Canadian apples, besides Great Britain, and what varieties are in demand?

Mr. EDWARDS: I made one shipment to the Old Country in connection with a friend of mine, and I found that the nett returns from all the varieties sent were about $1.89 per barrel here. The Blenheim Orange, of which I sent 27 barrels, realized exactly $3.13 here after all expenses were paid. All the rest—including Northern Spy, some Ben Davis, some Russets, Rhode Island Greenings, and two or three barrels of Fameuse—which should not have been sent at all—netted exactly $1.57 per barrel; so that the Blenheim Orange netted within one cent of being twice the returns of the others. It would strike me, therefore, that the Blenheim Orange was, for the British market, a more profitable variety than any others that were sent at that time. It sold readily at a time during last year when the markets were quoted as being from 10 to 16 shillings, and where no other variety in the same shipment realized more than 16 shillings the Blenheim realized 18, 20, 22, and one barrel as high as 25 shillings. The trees bore well also.

The PRESIDENT: Which of the three classes would you put it in?

Mr. EDWARDS: It would be called with us a mid-winter apple.

The SECRETARY: With us, in Southern Ontario, it would be called an early winter. I think the apple has been very wisely brought before us, and deserves all that has been said in its favor. It is one of our best apples for the British market, and one that grows lean and good, and is therefore very desirable. In mentioning two others—including

the Blenheim as an early winter—I would suggest the King as a mid-winter apple. That apple is growing in value every year in the British market. The last returns that I read classed it away up. It is constantly growing in favor and rising in price, but the difficulty is in procuring it in sufficient quantity—the tree is not a good bearer. The fact has been brought before our Association in times past that the King apple will produce better if grafted upon the Talman Sweet; and if this is true it opens out a remedy. Of course for a late keeper the Roxbury or the Golden Russet are about the only apples that we can plant. For the British market the Spy does not seem to succeed as well as it does in some other markets. It does not bring as high a price as either of those we have been speaking of. The Baldwin carries so well that it stands well in the British market.

The PRESIDENT: What are the bearing qualities of the King in this district?

A DELEGATE: Poor.

J. G. GALVIN (Peterborough): Also the Baldwin. I find the Wagener one of my best.

The PRESIDENT: Do you find the Wagener a hardy tree here?

Mr. GALVIN: Fairly hardy; but it is a grand fruit.

The PRESIDENT: For the early winter?

Mr. GALVIN: Yes.

The PRESIDENT: A short-lived tree?

Mr. GALVIN: Yes; but very productive while it does live.

Mr. BEALL: With us the Ontario apple is doing exceedingly well. This last winter we have had scarcely any winter apples of any variety—all have failed except the Yellow Bellflower—but the same trees, for instance, that would produce from a bushel to two or three barrels last year, would produce this year only from half a dozen to a peck, and then what we had were very poor. The same rule would apply to all other of our winter varieties—scarcely a good apple in all.

The PRESIDENT: Can some one suggest a later apple than the Blenheim or King?

Mr. EDWARDS: I believe the Ontario apple will in a few years from now be one of the most profitable that can be grown in this country. I understand they have been sent already to the English market, and have brought first-class prices—equal to the best.

Mr. SMITH: Is the tree considered quite hardy in this section?

Mr. EDWARDS: Yes, perfectly hardy. I have not seen the slightest indication of anything else. I have several trees. There is only one question yet to be considered in regard to it—as to the length of life of that tree. It may partake of the short life of one of its parents. The fact that it bears so early and so very abundantly would show that that is one of the possibilities. I believe there is nothing to show that that is the fact; but that is the danger.

The PRESIDENT: What has been the experience in this locality in connection with the Spy as a profitable apple for the British market?

Mr. BEALL: In growing apples for profit, there are a good many things to take into account. The trees will cost the same, perhaps, but the Northern Spy will take, in our locality, from 12 to 15 years to come into bearing, and not more than 25 per cent. of the trees will ever come to a bearing condition—they never live that long. No doubt it is principally because of the bad condition in which they are planted and cared for. I know of cases where there has been proper care and no loss. Then the Ontario will produce as much to the tree, and will come into bearing in the second, third, or fourth year—or the third year after planting from the nursery—and will bear almost every year. The reports we have from the Ontario apple in the British markets show that it is fully up to the Spy, or a little beyond.

The PRESIDENT: They have not had very much experience yet in the British market with the Ontario apple, as it is a comparatively new apple. The Ontario was introduced to take the place of the Spy, largely on account of the tree coming into bear-

ing so much earlier. The Ontario is a direct cross between the Wagener and the Spy. It partakes largely of the properties of the Spy, and the tree partakes of the properties of the Wagener by early bearing; but up in the Huron district I have found the last year or two that the Ontario is not going to be a long-lived tree; it is going to fail, as the Wagener tree does It is going to be a heavy bearer, and it is already showing all the indications of scrubbiness.

Mr. Robson: I would acquiesce in what the President says about the tree, and also corroborate Mr. Beall's statement. I never saw anything so abundant in fruit as the Ontario apple is when grafted on the Talman Sweet. It was covered with fruit, and very fine specimens, every one of them. I think grafting on the Talman Sweet would be the very best way to produce the Ontario apple.

Mr. Caston: I think that the same might be said in regard to some of the best of our commercial apples—the best way to produce them would be to graft them on Tolman Sweets. I have had a number of years' experience now in growing an orchard, and I would plant a great number of Tolman Sweets, because I don't know of any better stock. It is very hardy, and very suitable for grafting on. You can form a nice top on it; and I would graft on to this the Northern Spy, the King, and from what Mr. Edwards said, I think I would be inclined to try the Blenheim Orange, which is a comparative stranger to me. Only once I met it in our section, but it seems to be grown in great perfection in Oxford county. There is another apple I would like to try—the Newtown Pippin—that brings the very highest price of anything I have been able to see that has been sold on the Liverpool market Do any of our Niagara district growers know anything about this apple? Does it succeed there? Would it be likely to succeed in any other part of Ontario? Would it succeed if grafted on hardy stock? If so, it would be one of the best apples we can get. I should judge the best way to proceed in this locality, and in many parts of Ontario, would be to plant only the very hardiest trees, and plant a number of Talman Sweets, or something that is very hardy, and then graft while those trees are young.

The President: How many years?

Mr. Caston: It depends on the growth of the tree. As soon as I get a limb as large as my thumb that would hold a graft, I would begin and take a third of the top off the first season, and and a third the second season, and the third season I would finish it. Graft far enough out from the body of the tree so that you will have your top not too close together. In that way we can bring the Spy into earlier bearing, and the King into more productive bearing; and I think we ought to grow more of those apples. We find that the King stands next to the Newtown Pippin in commercial value, and it certainly is a splendid apple and it is hard to equal it in flavor at this time of year—and I think that would be the best way to proceed. Now, we have another among the new varieties that I would recommend from experience so far, and that is the Pewaukee; it is an early and abundant bearer. It is an extremely hardy tree—as hardy as the Duchess It is a seedling of the Duchess and is nearly as handsome as the King, though not up to it in flavor. I would like to hear from some in the Niagara district, whether we could grow the Newtown Pippin top-grafted on hardy stock.

Mr. Smith: It is worthless in the Niagara district.

The Secretary: It is one of the oldest apples in our district, but one we don't grow because we can't. It is more liable to scab than any other. At the World's Fair there was shown some magnificent samples that were grown in New York state; and the superintendent of that exhibit said that they were grown clean and beautiful by the application of copper mixtures by spraying. Should we be able to overcome this difficulty in that way, we shall be able to grow that magnificent apple.

Mr. Caston: Wherein does its great excellence consist?

The Secretary: Its good appearance, good size and very high quality. Of course its quality is its great recommendation. There is a yellow Newtown Pippin and a green Newtown Pippin.

Mr. SMITH: Which do you consider the best?

Dr. BEADLE: It is the green they send to Great Britain. Thirty years ago we planted out about a dozen trees at home, but we never got any fair fruit. It always from the very start began to scab. From all the trees we would perhaps get a peck of apples that were fairly good: and it kept going on from bad to worse until we could not get a solitary apple that was any good. Then we abandoned the idea that we could cultivate it. Now we have got new light on the matter of the apple scab, it is possible we may be able to grow it. It was just as true in all western New York as it is in the Niagara district—it scabbed: but there was just that one particular locality on the Hudson River about five miles long by a mile wide, where they could grow that apple to perfection, and they did and took great pains to treat it as a choice apple—pack them up in paper as they do oranges, pack them in half-barrels and get as much for a half-barrel as we do for a whole barrel.

The PRESIDENT: The Newtown Pippin has been tried in Goderich district. It has not been troubled with the scab there, but it is never going to be a profitable apple on account of the great amount of cultivation necessary to bring it to perfection.

Mr ROBSON: There is another apple come out—Magog Red Streak; I would like to hear about it.

Prof. CRAIG: That has been brought out on account of strength and hardiness of the tree. The apple will not rank with the Newtown Pippin, Ontario, or even Baenheim Pippin. It is not sufficiently attractive either. In this district, where apples take on a very high color, it might be sufficiently attractive, but as ordinarily grown it is not a handsome apple, and I don't think it is one that can be very generally commended.

Mr. TURNER: The Pewaukee is a favorite with us, and hardy also—a fine large fruit.

The PRESIDENT: I don't think too much can be said in behalf of Pewaukee. It is a good bearer and very fine shaped apple.

Mr CURTIS, an old resident of Peterborough, told of his great success in small fruits. He recommended vigorous measures against grass and weeds and suckers.

The PRESIDENT: Prof Craig has something to lay before us, and I think we had better hear from him now.

Prof. CRAIG's paper was illustrated with the aid of a large chart showing apples of some variety grown in different localities.

MODIFICATION OF FRUITS BY CLIMATE.

Mr JOHN CRAIG, Horticulturist, Central Experimental Farm, Ottawa, read the following paper:

The variations and modifications wrought by the influence of climate on plants and their products has long been a topic of interest and a subject of research and I might add of speculation by the student of botany and natural history.

Much has been written with regard to the effects of climate on plant and animal life, and we find great variation in plants as a variety is moved from its original centre of development. Again, we find particular requirements and special provisions made for certain plants whereby they are enabled to endure the rigor and vicissitudes of the climates in which they have been developed. Thus it is that we find with plants natives of a dry climate, that their leaf surface and stomata or breathing tubes have been reduced to the smallest possible area and number, thus giving the least possible opportunity for evaporating moisture. Examples of this class are found in the hot and dry climate of New Mexico and Arizona where the fleshy and prickly leaved cacti abound. In the character of other products the modifying influence of climate is also observable.

I have mentioned the change in the character of the leaves or foliage. There is also a distinct change in the color and shape of the fruit as well as the size, weight and color of the seeds This latter peculiarity has been noticed by Thomas Meehan in comparing the weight of seeds of our American trees to their European allies. This modification of plants and their products may be direct, and influence the immediate progeny or it may be indirect and the variation is preserved through long years by means of natural selection working in the wake of gradual change

Some of the interesting features connected with the late Columbian Exposition to the Horticultural student were the variations shown by the same variety of fruit grown under different soil and climatic conditions. In fact so wide is the variation in apples of the same variety that frequently the Ben Davis of New Mexico or Arkansas for instance is quite unrecognizable to the fruit-grower who has been acquainted with this variety, say as grown in Michigan or Ontario.

A brief study, as opportunity offered, was made by the writer, of the variations of form of a few of the standard of apples as grown in different apple regions of the northern continent. In this study, while the larger share of the incentive may be of scientific interest, yet most fruit dealers recognize the fact that the form of the apple has an important bearing on the shipping and consequently keeping qualities of that variety. It is well known to shippers that a round apple of regular form will ship and carry much better than an oblong irregular and ribbed variety. So that in looking over the diagrams which I am using as illustrations you will easily see wherein this question of variability of form has a practical bearing.

Taking Ontario as a centre and travelling westward, the round apple seems to become elongated and to have reached a distinctly oblong form. When we arrive at the Pacific coast in British Columbia, Oregon or Washington, with this lengthening tendency is developed prominent ribs on nearly all varieties, with frequent wrinkling about the calyx. The same changes are noticed when the variety is carried eastward into Maritime Provinces, but to a less marked degree.

With regard to color—travelling east and west from the point mentioned, the coloring and marking becomes less vivid, except in the case of the Blue Pearmain which in British Columbia and Oregon is as highly colored as the same variety grown in Quebec or Ontario Another point not clearly shown on the diagram is the increasing size of the core and seed cavities in the western apples.

In discussing the variations it is not difficult to say that it is a change due to climate, and there let the matter rest, but why should the variation always proceed in the same direction?

A study of the development of an apple from the blossom is an interesting one. L. H. Grindon in his charming little volume on fruit trees, describes it and the flower as follows:

"The upper portion of the flower stalk is deeply concave, the sepals of the calyx springing from the margin as do the petals and the numerous stamens, while in the centre are five slender pistils. The curious should note this carefully since the apple as regards structure is one of the most remarkable productions of nature. The rule in plants is for the ripe fruit to consist only of the matured ovary. In the apple the matured ovary is the smallest portion of the fruit. Soon after the petals drop, the vase-like top of the peduncle becomes gradually distended with juicy tissue. By degrees it adjoins itself to the petals within. These at last become completely embedded and constitute the core (French, *Cœur*), the heart. A horizontal section of the ripe apple shows plainly where the adhesion took place, this being indicated by the green fibres. A ripe apple is thus in truth a fruit within a fruit."

The elongation of the ovary noticed in the specimens grown near the seaboard seems to be favored by climate, and the longer growing period gives it an opportunity to develop in this direction. On the other hand, in the drier and hotter climates of the interior the ovary is more rapidly developed and opportunity for elongation is not afforded, therefore the fleshy part of the apple is laid on laterally.

We learn from this brief glance at the modifications of fruit as wrought by climate, that each apple has its particular locality where it reaches the highest state of develop-

ment. Thus we find that Ben Davis of Missouri and Iowa surpass in beauty and quality, those grown elsewhere. Although they will not keep as long as if grown in Wisconsin or Canada. Again the Northern Spies and Kings of Ontario—and of particular sections of the Province—are unexcelled by those grown elsewhere. Nova Scotia has long been famed for the fine quality and appearance of her Gravensteins—which after all are produced with the best results on a comparatively limited area.

It is manifestly very desirable that the fruit-growers of the province should study these cases of local adaptation in order that in the present era of close competition they may be able to place Canadian fruit products on the markets of the world with profits to themselves and credit to our country.

The PRESIDENT: I will name Messrs. A. H. Pettit and McNeill and Dr. Beadle, the persons to constitute the Legislative Committee.

Mr. A. H. PETTIT: I would urge very strongly to appoint a larger committee, not less than five, and that they fairly cover and represent all parts and interests of the Province, then when their report comes that it should be open for discussion.

The PRESIDENT: Well, in order to expedite matters I will enlarge that at once by adding Mr. Edwards and Mr. Boulter.

Prof. CRAIG: I intended to have said something on the fact that Ontario growers have one of the finest climates in the world in which to grow the finest apples; but that has been so well brought out by the ex-president that I will not detain you longer.

The SECRETARY: I have been growing Gravenstein. The trees are probably thirty years of age—they were planted by Mr. A. M. Smith; they are very thrifty and healthy and bear regularly, and very good samples of fruit. I am inclined to think they are not excelled by even those beautiful Nova Scotia Gravensteins that we saw in their exhibit at Chicago. If they do not equal them they are very close to them. One summer I shipped ten barrels to the British market, and I was rather surprised as well as pleased to find that they sold at $6 a barrel. I am only sorry that I have not a large orchard of that variety. I believe it will be one of the most profitable fall apples we could grow to ship in those sections of Ontario where it succeeds. I do not know that it would succeed in other parts as it does where I live—on the borders of Lake Ontario.

Dr. BEADLE: A few weeks ago I received from Nova Scotia some samples of a Gravenstein apple which was a natural sport of a branch of a Gravenstein tree that has now been propagated for about eight or ten years. It has a much higher color than the ordinary Gravenstein apple as grown in Nova Scotia. The letter stated that in Nova Scotia they had been unable to grow that apple with as high a color as they wished, and as they believed it grew in Ontario, but that this sport was about to relieve them of that condition and give them a high colored Gravenstein apple, and as they had propagated it now for a number of years they thought it was likely to prove permanent, and enhance the value of the Gravenstein in the British market. I think I could easily get some scions of this sport, and I thought it would be well to get some of our friends to graft it into their Gravenstein trees here, and see how it compares, in point of color and flavor and appearance, with our own Gravenstein. The sample sent us was a small apple, and the writer of the letter said that they were inferior in size to what they had had, but the best had been sent to Chicago and other places in the States in order to get the opinions of people there in regard to the fruit. I would like to see this tried side by side with ours, for it did not strike me that it was so much more highly colored than our Gravensteins. I have grown the Gravenstein for twenty years, and I never thought it lacked color—a beautiful apple with a strong flavor, and I quite agree with our secretary that if that apple were picked and promptly handled and got into the British market in good order, it would always command a high price, for it has a most beautiful appearance and as to quality is perfectly satisfactory to any Englishman's taste.

Prof. CRAIG: I saw at Chicago specimens of this apple referred to by Dr. Beadle, and also received specimens at Ottawa. I received scions, and they have been top-grafted on both Wealthy and Duchess at Ottawa, and I have a diagram of the particular apple, which is called Banks' Red Gravenstein.

Dr. BEADLE: That is the one.

Prof. CRAIG: It is quite distinct from the ordinary Gravenstein, it has a better color.

The PRESIDENT: They are advertising scions for sale in two of our Ontario papers.

Mr. BEALL: The late Mr. Dempsey showed me in his place two apples; one was what everybody understands to be the Gravenstein, and the other was what he called the true Gravenstein. There was very little difference in appearance to an ordinary observer. One had a very much higher flavor than the other, but if it stood on its base it invariably had one side a little higher than the other—that is the good variety—and the other was quite flat. The inferior variety was much larger grown than the true Gravenstein.

Mr. MCNEIL: This matter of variation in climate and soil as affecting fruit is an extremely interesting subject. Perhaps variation is not so noticeable in any fruit as in grapes. I don't believe Concords grown here are anything like those we grow in the west. On the other hand, we grow Delawares there to perfection, as far as appearance is concerned; in fact I think the large Delaware is as fine a looking Delaware as they grow in the Niagara district; but the few Delawares I have grown there have actually gone to waste; they are sweet and very insipid—there is nothing about them to amount to anything. The same with our Niagaras—they are positively nauseous, nor are they as perfect in foliage and bearing as they grow in the Niagara district. On the other hand Concords grown in New York state are not at all the same as we grow; they are a muddy grape and a thicker skin, and hang to the bunch well. Our Concords drop very freely from the stem as soon as they get ripe. Our vines come from Fredonia, and are the same vines they are using in New York State, so that it is not a matter of different varieties but a matter of soil and climate; but I could tell the difference between the varieties by simply sampling them. It occurs to me that the directors of this Association might do service to the people by making a large map of their several districts, and noting the pecularities of fruit culture in the different sections of each division. I think I could mark out in Essex County, and shade off the number of districts that would show where different fruits could be grown successfully, and where they would not, and we might bring data together, and if we could not draw any conclusions from it ourselves, those that come after us possibly might.

The SECRETARY: While we were speaking of apples, I was desirous of calling your attention to this sample of Jonathan, which was given me by Mr. Coleman, the Secretary of the Iowa Horticultural Society, who was superintendent of their exhibit at the World's Fair, and he told me that with him and in the State of Iowa the Jonathan was one of the most profitable apples they could grow. It brought more money than any other apple he put up for market. It is a beautiful dessert apple, has nice size, beautiful color and excellent quality. It seems to be perfectly at home there. I don't know that I have seen it anywhere else grown to such perfection as these samples are. It has been shown for some years at the meeting of the Western New York Horticultural Society at Rochester. They praise it very highly there as a dessert apple, but it does not grow so large in New York State as this. Samples were also shown from Quebec Province, but they are much smaller and not so fine as these.

The PRESIDENT: It resembles somewhat our Cooper's Market.

The SECRETARY: It is altogether a deeper red, and the quality is different entirely It is an excellent dessert apple. It has only one fault—that it is inclined to drop, but then it should be gathered promptly. Another point I want to speak of. He states that it is a very hardy apple—that it endures 20° below zero quite well, without suffering in the least, and he says it is a very early and a very regular bearer. Of course, its time of maturity is early winter. Now, I believe it would be worth our while to consider this apple, and perhaps give it a test here in Ontario. It is for that purpose I brought it here to show you.

Dr. BEADLE: I have grown that apple I suppose for twenty years; rarely got it quite as large, taking the whole crop, as those two samples, yet frequently perhaps a fourth of those on the tree might be as large; but I notice one peculiarity about

these—the weight of the apple. If I remember correctly the apple grown at St. Catharines was not anything like as heavy as these. The quality of the apple is good. I do not call it a high-flavored apple. It begins to bear early and colors up beautifully. I have had them fully as bright in color as these, and it always takes the eye on the market, yet I never marketed it. I have often had people come into the orchard saying, "What a beautiful apple!" and wanting to know if they could get some barrels of it.

The PRESIDENT: How does it compare with the Wealthy as a dessert apple.

Dr. BEADLE: The Wealthy is a better dessert apple to my taste. I don't call it a first quality apple. It is fair, that is all as grown by me in the soil in which I grow it—a sandy soil. Possibly with a clay soil and different exposure it might be a higher flavor; very probably it would be.

Mr. EDWARDS: We didn't hear much about the Wealthy. What about that?

Prof. CRAIG: I think for the district of Ottawa, and other localities where we have cold, it is without exception the best winter apple that can be grown; but it must be grown with this fact in mind—that it bears heavily, bears very young, and is therefore likely to be short-lived, and must be cultivated highly. I have two rows of twenty trees each in the orchard, and have used it for top-grafting stock; and for the last three years—it was planted in 1888—it has been fruiting very heavily, every tree in the row. But in keeping it it must be picked early—that is to say, it must not be left on the tree till it has reached its most thorough maturity; but if picked about ten days before—that would be on or about the 15th September—and kept in a cold cellar, I have had no difficulty in keeping it over till April. But if left to ripen thoroughly on the trees it will mature in December and not keep much longer than the middle of January.

Mr. SMITH: Don't you find it to drop?

Prof. CRAIG: That is one of its faults. The stem is long and it sways with the wind easily, and blows off somewhat readily.

Mr. SMITH: It is the only apple that has borne an abundant crop with me this year.

Mr. TURNER: I would like to hear of the McIntosh Red—one of the best flavored apples we have.

Dr. BEADLE: Very subject to the scab in the Niagara District.

Prof. CRAIG: It is the same fault with the Fameuse in that direction, but where it can be grown free of this it is a very satisfactory apple of high quality, and keeps about as long as the Wealthy.

Mr. EDWARDS: Can the Wealthy be shipped to the old country with advantage?

Prof. CRAIG: Yes, it has been shipped, not in barrels, however, but in compartment cases—the apples being carefully selected.

The PRESIDENT: I see nothing on the list with regard to the pear scab, and I think some here would like to hear about it. It is a matter that is creating some attention lately—particularly with regard to the Bartlett and the Flemish Beauty. I think Prof. Craig had better give us something on that before he leaves. A party near me was thinking of grafting some other varieties into his Flemish Beauties, but he did not know whether the spot would be transmitted from that variety to them.

Prof. CRAIG: I have found a great many Russian varieties to blight in the vicinity of Ottawa. I have other varieties grafted on them which do not blight and the disease has not attacked the graft; and in the same way the varieties not subject to scab, grafted on Fameuse, have not been affected to the same extent as the Fameuse apple grown on the same stock on its own tree; so that reasoning from that point of view, I don't think the disease would be transmitted in any constitutional way by reason of the union. I am glad to chronicle some very striking successes by fruit growers on the Island of Montreal in spraying for the prevention of pear scab. Flemish Beauty is about the only variety that is grown there to any extent, and in the last four or five years they have been very much troubled with the black spot, and cracking, which is very much allied to the ordin-

ary apple scab. I have suggested spraying with the Bordeaux mixture, and I have reports this fall saying that while the pears have not been entirely free, yet the results have much more than paid for the cost of application. In conversation last evening with Mr. Murray Pettit, he said that while in many cases he did not think he had any results, yet in the case of the Flemish Beauty sprayed with Bordeaux mixture, he thought it had paid him to do it.

The PRESIDENT: Do you think that spot on the Flemish Beauty will yet be overcome so as to save that variety of pear?—because there is a strong feeling through the Huron district to discard that variety altogether.

Prof. CRAIG: Alongside the collection of Newton Pippins grown in New York State, referred to by the Secretary, were specimens of Flemish Beauty very badly scabbed, and others quite free. A card was placed on one of the latter, stating that these had been sprayed with the copper mixtures and the others, which were scabbed, had not been sprayed. There were also samples of the Seckel Pear with the same history, and if we are to take the evidence and words of these gentlemen—and I think we safely can—we are led to believe that the spraying for the prevention of this disease is going to be a paying practice.

Mr. A. H. PETTIT: I think last year you reported great success in reference to destroying mildew on gooseberries. Has it been successful again this year?

Prof. CRAIG: Yes.

Mr. ORR: Eight years ago my Flemish Beauties were paying $8 to $10 a tree. They have been failing from scab the last five or six years. We have been spraying the regular Bordeaux mixture, Paris green and lime, but they have become practically barren. I thought of top grafting them, but they have such beautiful foliage and are of such fine shape that we do not want to do it.

PROF. CRAIG: There is no doubt that the disease (apple scab) can be stopped, because I have done it. This year I sprayed a row of crab trees in the orchard, which blossomed heavily, and after the blossoms had fallen and the crabs had attained the size of large-sized garden peas I noticed that the spot had made its appearance quite generally. I immediately had the trees sprayed, using Bordeaux mixture double strength; that is, the old formula—six pounds and four pounds—taking care that every part of that tree was covered thoroughly. You know that all the instructions which have emanated from the Experimental Farm have said that this remedy was preventive, and therefore the application must be put on before the disease had a foothold Now, in this case the disease had a foothold; but I tell you, gentlemen, I examined these trees ten days afterwards, and, in every case where the Bordeaux mixture had fallen on a spot of the fungus it simply scaled off and, while the apple was somewhat distorted, the disease was not allowed to develop any further. It just showed me that this is a question of doing the work thoroughly and well. I know the conditions that arise in connection with this spraying matter, because I have handled the pump and the nozzle and have made the mixture myself, and have gone through fifteen acres of orchard and I know it is one of the most disagreeable pieces of work imaginable; but it is just a question with you fruit-growers whether you will do it and grow good fruit or fail by not spraying—and it is a question of doing it thoroughly. Speaking of experience in connection with gooseberries, I have some evidence here from Mr. Tweddle, a neighbor of Mr. Orr, whom I referred to before. He writes me: "The first brood of worms appeared in myriads shortly after the fruit set. A single application of Bordeaux mixture was given when the worms were first hatched, when only one-eighth of an inch in length, but not all were destroyed. When, two or three days later, worms again appeared and were large enough to destroy foliage rapidly, two more applications were made on the same day, going opposite ways on the rows and covering the foliage completely. This was completely successful in destroying the first brood, and also the second brood, for the lime in the Bordeaux mixture stuck the whole thing to the foliage and it remained all season, and if any second brood hatched they got their dose and vanished without delay. The currant worms must be easier destroyed than the curculio, else we must attribute the loss from

curculio on plums, treated the same as the currant, to some other cause that is not apparent. No mildew or sun-scald appeared on the English gooseberries, yet both affected neighbors' plantations under similar conditions where no fungicide had been applied; and this points to considerable benefit in these cases." That is the Bordeaux mixture with Paris green. Now, the use of sulphide of potassium has been so well demonstrated that I need not further urge its beneficial effects in preventing gooseberry mildew.

Mr. A. H. PETTIT: In mixing this Bordeaux mixture for currant bushes, do you use the same proportion of Paris green as when spraying for trees?

Prof. CRAIG: I use the same proportion. It may be a little more than is necessary, but if you keep changing formulas you are apt to make mistakes, and the one that was recommended is certain to kill them.

Dr. BEADLE: One pound to 200 gallons of water?

Prof. CRAIG: It was 4 pounds of copper sulphate, 4 pounds of lime and 4 ounces of Paris green to an ordinary barrel of water.

Mr. ORR: With plums we make a perfect success of spraying, but the pear trees bother us, though we covered them with Bordeaux mixture till the trees looked as if they had been whitewashed.

Mr. RACE: What time in the development of the plum did you do this?

Mr. ORR: Before they bloomed at all. We have followed it up thoroughly for one or two years. The spot first appears when the pear is from the size of a pea to the size of a marble. We tried spraying before the bloom, then followed it up afterwards.

Dr. BEADLE: Don't you think the ammoniacal carbonate of copper would be a good mixture?

Prof. CRAIG: It is a matter of convenience for the grower and depends on which he can mix and use most easily. I have not found it any more effective. I would like to ask Mr. Orr if he left any trees unsprayed, and was the crop entirely destroyed?

Mr. ORR: It has grown worse every year, until now it is utterly worthless. We had not a specimen fit to market last year or the year before.

The SECRETARY: Yet they were treated with Bordeaux?

Mr. ORR: Every year, with one exception.

Prof. CRAIG: When did your treatment close this year?

Mr. ORR: I cannot give you particulars. I was not at home this year. I can give you all particulars by mail.

Mr. CASTON: This scab seems to affect the Flemish Beauty pear every year. We find that when we have a season where in June, say, we have a considerable amount of close, moist weather—just the kind that will rust wheat—it affects the apple. These fungus diseases are pretty much of the same nature. Last year apples were comparatively free from scab in our section, because we did not have that peculiar kind of weather that fosters it, but this year we had. The scab seems to affect the Flemish Beauty pear every year, no matter what kind of weather we have. I don't know how it is. I think the location has something to do with it. Where it is close and does not get a proper circulation of air, I think the scab will be much worse than where it is open.

Mr. SMITH: I have had gooseberries scalded by the sun and drop off really cooked in a very dry season, particularly where they have been somewhat affected by the fungus on the leaf; and the foliage was not very heavy.

The PRESIDENT: It rarely occurs except where the leaves have been stripped by the worm.

Mr. PATTISON: I grow a great many Flemish Beauty in the same district as Mr Orr, and this year they were perfectly clean—with a few unimportant exceptions. I did not spray at all—never have sprayed. Has Prof. Craig had any experience in the treatment of tomato rot with the Bordeaux mixture?

Prof. CRAIG: I have not personally. I think it has been used, but I don't think it ever can be a practical remedy in growing tomatoes, because the rot appears at a time when the tomatoes have to be marketed, and the Bordeaux mixture would stain them so as to be unmarketable.

Mr. PATTISON: This year the rot began very soon after the tomatoes were formed with me. A young friend, who lives not far from me, claimed that he had completely checked the rot on his tomatoes with the mixture.

Mr. TURNER: I think you will find that manure induces the rot in tomatoes.

Mr. WHYTE: I grow over 40 varieties of gooseberries. Last year it was very difficult to keep back the mildew. This year I had no difficulty whatever with it. They received the same treatment as last year—half of them with copper carbonate and the other half with potassium sulphide.

Prof. CRAIG: While these diseases are of fungus origin, as Mr. Caston remarked, and their development may be assisted by certain climatic conditions—one of the prime helpers in this being great moisture of atmosphere—yet we cannot say that the climate causes them, although it may assist them.

Mr. CASTON: Scientific men tell us that the germs of these diseases are always present with us, but that some seasons are more favorable for their development. That is what I meant to say.

Mr. ORR: I was collecting fruit for the World's Fair for six to eight weeks, from Ancaster down to Niagara -all through the Niagara Peninsula—and I only met two specimens of good Flemish Beauty pears that I could send on to Chicago.

Prof. CRAIG: What were the conditions surrounding those specimens?

Mr. ORR: I don't know. They were grown half a mile from our place. One weighed about a pound, and the other about 15 ounces.

Mr. RACE: The Flemish Beauty in our locality has become positively useless.

Mr. A. H. PETTIT: A great many fruit-growers in our section think a dry season is more favorable to mildew than a wet one.

Prof. CRAIG: Powdery mildew is very common in a dry season.

Mr. HILBORN: I have found the best remedy to be to change the location—plant in a different part of the farm every season. It is always worse in the dry season with me.

Mr. BOULTER: This year was the worst for rot on tomatoes that we ever had. Hundreds of bushels had to be thrown away. It commenced in the end, and worked right down through. We did not think it safe to take any of these tomatoes for the factory. If they were put in crates, after a day or two the spot would work down through the tomato—black all the way through.

Prof. CRAIG: I do not know that I can state that it could be controlled commercially. I do know that it can be prevented in a small way, and has been done.

The Secretary moved the adjournment of the Convention until 7.30 p.m.—it being now 5.30 p.m. Carried.

SECOND DAY.—EVENING SESSION.

The PRESIDENT: We will go on and take up a few questions. Sometimes it is very well to have an experience meeting, especially when it is not over large; and here is a question on the programme that will very likely draw out some valuable information, and we would like every one of you to have something to say on it. Suppose we take up No. 4:—"Give instance of the largest yield of apples from any one tree; giving variety of tree, soil and cultivation?" Who among you will venture a few remarks on that?

Mr. CASTON: Mr. Woolverton, I think, can lead us off.

LARGE YIELDS OF APPLES.

The SECRETARY: Mr. Bengough says he supposes this is the department for "fish stories" to come in. (Laughter.) I hold in my hand one or two communications in answer to this question. I will start out by telling you my own experience. The largest yield that I know of in my orchard was from a large Rhode Island Greening tree, I should say eighty years of age, grown in deep sandy loam, where it spread to an astonishing size. In one season we gathered from that tree 15 barrels of Greening apples; and on another bearing season we gathered 20 barrels from that one tree. I don't know whether anyone present will be able to tell a bigger apple story than that; but if so, we would like to hear it. The Niagara district can beat any other part of the Province for a big yield. As to cultivation, this tree didn't have any. It was grown in grass, but the soil, being sandy loam, did not get bound and hard; otherwise it would have required treatment. Then it was good rich soil; and the great extent of foliage so perfectly shaded the ground beneath that the grass did not grow as it would otherwise. There is really no sod, although there was no cultivation.

Mr. WHYTE: My story is not so big as the Secretary's, for we are not expected to have as large ones near Ottawa: but I do know of a Duchess tree that for two years bore 30 bushels—about 10 barrels—each year. It did not get much cultivation. It was grown in an ordinary garden, but weeds were kept down below it.

Mr. TURNER: Our late director, Mr. John Croil, had three Fameuse trees in front of his house, which three years ago bore six barrels each.

Mr. J. W. SMITH (Peterboro'): If we told such stories here they would put us down for story-telling. I am not saying it is not correct, but I would like to get a few grafts off them. (Laughter.) I would graft them on the Tolman Sweets.

The PRESIDENT: What yield have you had out here on your Tolman Sweets?

J. W. SMITH: It is an apple that was not much taken in the market, but it takes better now. It is a grand tree to graft on—either it or the Ben Davis. I have had good luck in grafting on both of those.

JAS. TOOLE (Orillia): I took 22 barrels of Duchess off six trees; and last year I took 15 barrels of Snows off five trees: and nearly twenty years ago—it's a story I don't know as I dare tell—["Tell it!"]—at Frenchman's Bay I took 17 barrels of Fall Pippins off a single tree.

The PRESIDENT: I think we may dismiss the Secretary now, and let him go home. (Laughter.)

Mr. TOOLE: That was a very old tree—about 60 years old.

The PRESIDENT: Do you find the Duchess a profitable apple?

Mr. TOOLE: We can grow more Duchess in Orillia and neighborhood than anything else off the same number of trees.

The PRESIDENT: Mr. Dempsey, we would like to hear from you.

Mr. DEMPSEY: I have never had any of these great big yields yet. Seven or eight barrels is about the largest we had. I took seven barrels of Gravenstein off one tree last year.

Mr. CASTON: Last year I took 8 barrels of Alexanders off a tree that was planted about ten or eleven years.

The PRESIDENT: How does the Alexander stand out this way in the market or for home consumption?

Mr. CASTON: I think it will bear more for the time planted than almost any other tree. The apples are so large, they fill a barrel up very quickly.

Mr. BEALL: I would like to ask: how much money has any person made off one tree not more than twenty years of age? I ask this because it is not apples, but money, people want off trees. I would rather have two barrels at $4 a barrel than six barrels at $1.50 a barrel.

The PRESIDENT: Was a large percentage of those apples fit for market?

Mr. CASTON: In the case of the Duchess they were nearly all fit for market, and also the Alexander.

The PRESIDENT: Is the Duchess going to have a market?

Mr. J. W. SMITH: The Duchess is a fine apple in appearance, but it is not a marketable apple here, as far as I am concerned.

Mr. FISHER: At Orillia we like the Duchess for profit. This spring I sold 60 barrels off 75 trees planted seven years ago last spring. I sent them north, through the Muskoka District, where there was a good demand this year right through to North Bay.

The PRESIDENT: That is the best story we have had yet.

Mr. WHITE: What did you get a barrel for those apples?

Mr. FISHER: I realized $2 a barrel. Of course I paid for the barrels.

Mr. PATTERSON: A neighbor of mine claims that he got 18 bbls. of Greenings from one tree.

Mr. CASTON: I think we have heard from him already. (Laughter.)

J. M. SMITH: A good story can't be told too often. (Laughter.)

Mr. ORR. Mr. Burkholder, near Hamilton, has a tree that I heard yielded 25 barrels, and that he received $50 for the fruit; I think the variety was Tolman Sweet. He has one of the finest orchards I know of.

A BATCH OF QUESTIONS ANSWERED.

The following questions were on the programme:

(1) Is there an increase or decrease of orchards in Ontario?
(2) What change is observable in methods of cultivation?
(3) What variety is most profitable?
(4) Give instance of largest yield of any tree, naming variety, soil and cultivation.
(5) Name best varieties for export, one fall, one early winter and one late winter.
(6) What value have apples as food for stock?
(7) Why do we hear so much complaint about foreign canned goods?

The Secretary read the following replies:

MR. NICOL, of Cataraqui, wrote: In answer to the questions proposed I would state.

1st. During the past three years there have been only a few fruit trees planted in this district.

2nd. There has been no noticeable change in the methods of cultivation, only young orchards seem to be more neglected than formerly.

3rd. Red Astrachan, Fameuse or Snow, and Golden Russet.

4th. That largest from any one tree that I know of was from a Blenheim Orange tree belonging to E. Wright, of Waupoose Island. The quantity gathered from that tree in 1891 was 15 barrels of good fruit. The soil on which the tree grows is clay loam on limestone rock bottom, on grass land pastured with sheep.

5th. Blenheim Orange, Ontario and G. Russett.

6th. I think sweet apples are worth fully as much for cattle food as Swede turnips, but I find that sour apples fed even in small quantities have an injurious effect on dairy cows.

7th. I believe it is because of the use of copper for greening, and dissolution of lead compounds in long kept cans which become corroded by the acids in which the vegetables are preserved. I notice that there is in the Canadian market at present a large quantity of French canned vegetables, such as peas, beans and asparagus. In France canners of goods, for home consumption, are restricted, but for goods branded for exportation there is no restriction. I think the canning business should be protected so that poisonous foreign goods should not be in competition with properly preserved Canadian goods.

A. McD. Allan, of Toronto, wrote:

1. There has been an increase in orchard in the district, especially in Huron and Bruce and Grey, bordering on the water. And further there seems to be a disposition to further increase the area.

2. Orchardists are giving more attention to cultivation. We find the best results where orchards are cultivated. When they come into bearing that cultivation requires to be very light with regular manuring every year, and in light soils potash applied in liberal quantities. Cultivation to be kept up every season up to middle of August, when it should cease in order not to induce late growth. These are the points noticed by cultivators.

3. Duchess of Oldenburg, Gravenstein in Huron, and Colvert in northern sections; Ontario in West Huron; rest of county and Bruce, Baldwin, and part of Grey also; other part Ben Davis.

4. Alexander, about 20 years old, gave 13 bbls. this year near Goderich, light sandy loam, cultivated and manured. Baldwin last year in South Huron gave 9 bbls. in heavy elao soil, cultivated, all first class fruit; in orchard near this in vicinity of Zurich, in grass, gave 7½ barrels, not as good samples, same kind of soil. Trees, both about 18 years.

The President: What have you to say to this question: Is there an increase or decrease of orchards in Ontario during the past three years? We will speak of apple orchards first. That is a matter of deep interest, for we are aiming at an increase.

Mr. Orr: In our section there has been a decrease of apple orchards. Many have been taken out, and there are none being planted in our section.

The Secretary: It is the same in the vicinity of Grimsby, apple orchards are being dug out by the acre, and in their place small fruits—grapes, plums, peaches—are being planted.

Prof. Craig: It would be interesting to growers from the Ottawa district to know that there is a possibility of finding a market up at Grimsby and Essex, because I have a report that the area of orchards in Russell and Carleton has been very much increased in the last three years. Apples, small fruits, including raspberries and strawberries, have been largely increased.

Mr. Caston: The apple orchards in Simcoe County are certainly increasing, and we find more and more that it is better adapted to growing apples than any other fruit. I think it will come to this yet, that certain parts of Ontario which may be found adapted to the production of certain fruits will make a specialty of those fruits. Grapes and peaches will be grown in Grimsby and the Niagara peninsula and along the Lake Erie counties, while the apples will be grown further north, in what we might call the colder belt, and this will even up matters all round. As to a market for the Duchess, I could have sold ten times as many this year as I could get hold of. Of course the last crop was not large; but I can always sell all I can grow and a good many more. Very few people have an idea of the population that lies along the Canadian Pacific Railway, from north of Ottawa right out to the Rocky Mountains; while up in Nipissing and Algoma there is a large population engaged in lumbering, mining, railroading, etc.; and everything they use of that kind has to be shipped in there. That is where we find our markets, and there will be a great market there for years to come. I don't think they will ever be able to grow tree fruits there with any degree of success. I doubt if they will ever be able to grow anything better than the grape in Manitoba. I believe that will be a great market in the future.

Mr. Beall: I think there is no increase in my neighborhood to any extent. There are always a few trees being put in every year, of course.

Mr. Turner: The increase in Stormont county is very slight. They increase more in small fruits.

Mr. Dempsey: I am quite sure they are on the increase in our section. There is a good market for the Duchess. There is many a carload shipped out to Winnipeg from our section, and has been for years.

Mr. HILBORN: I think the apple is not increasing very rapidly in our section. They are going more into pears and peaches, but in some sections the apple is on the increase.

Mr. MCNEILL: I agree with Mr. Hilborn that in Essex apple orchards are decreasing rather than increasing. In Kent probably a slight increase. In Lambton a considerable increase. The peach and pear orchards are increasing in Essex very rapidly.

The PRESIDENT: I notice that Mr. Allan in his paper reports that orchards are largely on the increase in the Huron district. I do not know whether I can corroborate that statement or not; but this I do know—as I have for the last four or five years been judge on the fruit lists in all the shows up in that tract—that the interest taken by the farmers in apple culture is very largely on the increase. They will gather around the fruit exhibit at these shows, and they manifest a deeper interest in the different varieties on exhibition; and on every hand you find that they are anxious for information with regard to the varieties and the value of the varieties from the marketable standpoint. Now, I think we may take for granted that that is the case all over the Province—that the farmers are becoming more and more interested in apple culture.

Mr. EDWARDS: There has been a slight increase in the county of Peterboro', but not very marked. I think there has been an increase of interest among a certain few of the farmers in the county, and there has been some small increase generally throughout Canada, but it has not been very marked during the past few years.

The PRESIDENT: You think that increase has been such as to justify the efforts of this Association?

Mr. EDWARDS: I think so, most decidedly. I may say this—and I say it in view of the fact that we have not had very many here at the meeting—that, notwithstanding that, the influence of this Society is spreading throughout the country generally; and I know that many a man who has not been here at any of our meetings at all, is influenced and helped by the work this Association is doing. I have had that stated to me more than once—that it was a good work, and not to give it up even if the farmers did not turn out in large numbers; that the interest was spreading, through the reports published in the newspapers and otherwise, and that the information given was proving of use.

The PRESIDENT: It is a very good sign at our fall fairs to find farmers coming in with their pockets full of apples, and enquiring from the fruit judge what these qualities are. It is an evidence that the interest is increasing. We find that all over.

Mr. D. W. DUMBLE: There is a vendor of fruit trees in the meeting, who will perhaps tell you how many trees, and what trees he has sold, and whether the sale is increasing or not.

Mr. TROTTER: I cannot say our sales are increasing very largely, but still we keep them up to a very fair proportion every year. This year we find quite a cry of "hard times." The farmers have been depending on their grain crops in this section, and of course prices are poor, and they seem to be very slow to take up fruit culture, although we are doing our best to encourage the growth of trees by putting the best trees in their hands. I think in the next ten years, probably, there will be a great change in this part of the country in fruit-raising. In several other sections where we have salesmen the sales are very good, especially in the Belleville district. In this district I cannot say the orchards are increasing very much. There are no large orchards being put in. They are principally of twenty-five to fifty trees. Fifty trees is considered a large orchard in this section. I notice the interest is on the increase, and I think in the course of a few years there will be quite a change.

Mr. CASTON: There is one other question here which ought to be discussed—perhaps not to-night: "How should apples be packed and shipped?" In many localities there are too many apples grown, or not enough; that is, there are too many grown for the local market, and not enough to encourage men to come in and buy for export, and the market gets glutted, and people say there is not enough money in apples.

Mr. EDWARDS: That is just how it is here exactly.

Mr. CASTON: There is nothing to hinder any farmer from packing and shipping his own. He needs to know how to put them up and how to ship them.

SPRAYING FRUIT TREES.

Mr. A. H. PETTIT: We had an interesting discussion to-day about the spraying of fruit trees to destroy the scab. Now, we had experiences, *pro* and *con*, and we want to convert every man to the theory and belief that if it is properly done, and at the proper time, it will accomplish the work. I have a resolution which I intend to move, and have held it till Prof. Saunders was here so as to get his views on the question:

"That in the opinion of this meeting it is desirable that our Director of Experimental Farms be requested to make, during the coming season, at several centres of fruit culture, a public practical test of the efficacy of the solutions recommended for the prevention of the scab in apples."

I would suggest it may be done in this way: Let them come with their proper mixtures; have it mixed before a meeting, say, of 25 or 50 fruit-growers; select half a dozen trees of different varieties of fruits; have practical tests made—have mixtures properly put up, and three of the fruit-growers will guarantee to give a repetition of that same spraying as often as directed; and then let us at the end of the year proclaim thas that has been a *bona fide* experiment, practical and thorough, and we will begin then to get down to business—we will all get to work, or else we will all condemn it. I think it would be a step in the right direction.

Mr. ORR: Is it your intention to confine that to apples?

Mr. PETTIT: I mean to experiment as widely as they would think practicable to undertake. Let the test be made on apples in one section, pears in another section, and include plums and anything else that we can and bring it before a meeting of fruit-growers so that they can watch the test through, and at the close of that test, if successful, say: "It has been thoroughly successful in our section of country." (Hear, hear, and applause.)

Mr. MCNEILL: I take pleasure in seconding that motion, particularly as I am satisfied of the efficacy of spraying. Although I called yesterday for those who had had opposite experiences, there was no response. Yet to day we have had the most pronounced experiences in opposition to spraying. Now, this thing ought to be settled once and for ever, and if the professors can devise a plan for settling it, they will be doing a benefit to the country that can hardly be estimated in dollars and cents.

Mr. BOULTER: I think nothing has come before this meeting in comparison with this motion in importance. Something ought to be done if possible to obviate the serious loss to the fruit that comes from these pests.

Prof. SAUNDERS: I think probably there will be very little difficulty in carrying that out, but as it involves expenditure it would have to be placed before the Minister. I would be very glad to do my best to recommend it. I may say that my colleague, Mr. Craig, has carried on experiments in that way for two years in part of the Province of Quebec, and it would be quite in turn to do something for Ontario if the Ontario fruit-growers so desire. In this connection I might mention that I recently had a visit from a gentleman who has large peach orchards in South Australia, and he says that they can keep peach curl in almost entire subjection by spraying the trees in the spring, before the foliage starts, with the Bordeaux mixture and then giving them another spraying just as the young shoots are coming out. In that way they have almost perfect immunity from peach curl.

Mr. PETTIT: I have the greatest confidence in the work that is being done for us in the Experimental Farm, but I feel as though we want to draw them in closer connection with the fruit-growing interest. They are too great a distance from us. If they would come before a body of fruit-growers and have this thing practically demonstrated I believe we could convince the whole body of the effectiveness of the work, and the sooner we all become converts the better.

Mr. SMITH: I think this would be almost as valuable as the travelling dairy. (Laughter.)

Mr. ORR: I don't think I have heard any gentlemen express the difficulty with plums; the difficulty is with pears and apples.

Mr. PETTIT: Yes, I have heard complaints of that, and they have done different things without success.

Prof. SAUNDERS: Sometimes the difficulties are brought about by the differences in drugs used in spraying Sometimes the carbonate of copper would be of different strength when kept in powder form.

The motion was put and carried.

Prof. SAUNDERS: Let a copy be sent to the Minister of Agriculture.

Mr. EDWARDS: I would like to introduce to this meeting Mr. Kendry, the Mayor of Peterboro', who, unfortunately, was not able to be present at any previous meeting.

The PRESIDENT: We are glad to have the Mayor with us. Sorry he was not able to be with us before. I am also sorry there is not a larger number to hear him. We would like to have him come forward and say a few words to us.

Mayor KENDRY: I am very sorry I have not been able to be here before to receive you, but I trust that has been done by gentlemen of the town. I see our Police Magistrate (Mr. Dumble) here, and Mr. Edwards, and I know it has been done well. I was called away from town on business, and to-night I have had an engagement till the present time to try and arrange a union of Ashburnham and Peterboro', so that we hope the next time you come here, in place of coming to the town of Peterboro', you will come to the city of Peterboro'. (Applause.) I do not think I can say anything that would be of profit to you. I may say I am a judge of fruit, as far as the eating of it is concerned, but no further. (Laughter.) I thank you on behalf of the town for having done us the honor of this visit.

THIRD DAY.—MORNING SESSION.

THURSDAY, December 7, 1893.

At a meeting of the Directors of the Association, held this morning, it was resolved that during the coming year each Director be asked to undertake the work of forming horticultural societies affiliated with this Association, the expenses of such Directors to be paid, and the Secretary was instructed to furnish each Director with necessary information.

OPENING UP FOREIGN MARKETS.

Mr. ORR moved, seconded by MR. CASTON, the following resolution:

"That this Association memorialize the Dominion Government on the benefits likely to accrue to the fruit-growers of Canada and the public generally by the appropriation of a sum of money for the purpose of opening up the markets of Europe to the fruits and fruit products of Canada by a judicious placing of experimental consignments at advantageous points and by calling attention to our products by a system of travelling agents or by other methods that may recommend themselves."

Mr. ORR: It is not necessary to make any remarks on this subject. Our time is short. The necessity of this motion must be apparent to all.

The PRESIDENT: I think that is a matter that will be very clearly seen by all present. We all know the advantages we have reaped as a Province from the introduction of cheese and other dairy products into the European markets, and we do not see

any reason why similar efforts should not be made to introduce our apples, as their superiority has been as readily acknowledged during the last three or four years as the superiority of our dairy products. This resolution may stir up our authorities to aid us in the introduction of these products.

Mr. A. H. Pettit: This matter was referred to in my address. The action taken by our Government in the dairy interest has worked such great results that I could not see why they should not operate in the same way in the fruit interest, not only in fruits in their fresh state, but also in their manufactured form, if possible.

The President: The Government is going to take some steps for a display in one of the exhibitions on the Continent next year, and that will be an opportune time to introduce our fruits to the Continent.

Mr. Pettit: We can scarcely wait till the year 1900 for the World's Fair to come to develop our fruits in the different markets of the world. It wants prompter action than that.

The President: But I understood action was to be taken next year.

Mr. Pettit: Probably if this were placed before the Government strongly the Horticultural Department of our Experimental Farm would feel like taking the same interest in that branch of industry that our Dairying Department does at present in the dairy industry.

Prof. Saunders: I might say in explanation that the Horticultural Department of the farm is entirely on a different footing, relatively, from the Dairying Department. The latter has a special vote of its own for carrying out dairy interests, which is administered by the Dairy Commissioner, directed by the Deputy Minister. The farm work is carried on by a special vote directed by the Commissioner. The Dairy Commissioner is instructed to go all through the Dominion, giving our farmers such information as will enable them to manufacture uniform products and to make them of first-class quality throughout. Now, unless there can be a special vote got in that connection to help the fruit-growing interest it could not be managed out of the present vote which we receive for experimental farms as that is entirely used. Indeed, every year we are more or less behind in our administration on account of the insufficiency of the vote to carry out the work we are at present doing. I would not say a word in opposition to the idea suggested in the resolution. It is a very good one, and the industry, I think, should be helped as much as possible; but, in order to carry out that idea, it will be necessary to make some representations to the Government to induce them to give a special grant to the farm to enable them to do it.

The President: As I understand, this is the primary step to an end, and the next step will be for this Association to send a deputation down armed with this resolution, and ask for the necessary legislation.

The motion was carried unanimously.

The President: We are very sorry that Professor Saunders has to go to Ottawa on the next train going east, and he has a few words to say to us.

Prof. Saunders: There is just one point I would like to mention in reference to the lack of uniformity that is prevailing to a great extent in the descriptions which are made of our fruits from time to time in the *Horticulturist* and in the other publications of this country. This lack seems to arise more or less from inattention or thoughtlessness on the part of the writers. We have an able and excellent example in the work of Mr. A. J. Downing; and anyone who studies that work will find that there is a uniformity of character in the descriptions; there is a regular succession of points, which he takes up in the same order in regard to any fruit, which enables any one who wants to study any phase of our apples to know at a glance just where he will get the particular point in regard to the fruit which he desires for comparison. For instance, in regard to

quality, it is always in the same place in the description ; and with Downing's work you can get the information you want in regard to the value of twenty or thirty apples in less than half the time that you can get it from the random descriptions that are being made now in the journals devoted to fruit culture by those who are describing fruits and describing them well. When there is no system in describing a fruit, very often some important points are overlooked. My object in bringing up this matter is, if the members think best, to get the endorsement of the Association to a regular order and method of describing fruit so that all the valuable points in connection with the fruit and the tree shall be covered in the description, and the latter as far as possible made uniform in our fruit literature. Now, Downing in describing fruits begins, taking the apple and pear, with the origin of the fruit, the character of its growth, the color of the wood, or other peculiarity, and its productiveness. The same would apply to the vine in describing the grape. If you want to know anything about the productiveness of the tree, you look in the first paragraph and you find it there, and it saves time—and time in these days is always a precious commodity, when we have so much to do. Then he takes the fruit, and begins with the size, dealing with the form, the color, the character of the stem and its cavity, the character of the calyx and its basin Then the flesh is taken up, for its color, texture, juciness, sweetness or acidity, its flavor, and finishing up with the quality of the fruit,—whether it is first class, medium, good or very good. The Secretary could easily put this in proper form in the *Horticulturist*, so that the same terms should be used as far as possible by all describers, so that they would have the same relative meaning in all sections of the country. In some senses it is a small matter, and yet it is one that will, I think, have a very important bearing on the progress of fruit culture and the intelligent appreciation of those people who are not able to give very much time to the whole subject. Downing finishes up his description by giving the period of ripening. Now, any one who wanted commercially to look over our fruits, in regard to the fruits that came in at particular seasons of the year, with a view of dealing commercially with our fruits, would only have to look at the bottom of the description to find when this fruit would be ready for market, if Downing's plan were followed. Otherwise you have to read the whole description, and that takes time. Then in plums and peaches the same order is followed. The character of the suture usually follows color, and whether the flesh is free or adheres to the stone is placed after the quality of the fruit. I would suggest that this matter be referred to the Secretary and somebody else, to think over the matter, and if there is not time to act on it at this session to bear it in mind and take it up at some future period, because I think it is a matter of considerable importance in connection with the progress of fruit culture.

Mr. McNeill : I suggest that we adopt the form.

Prof. Saunders : It would be a very good idea if the Association would adopt the form, and we would adopt the same form in the Experimental Farm, and it would ensure that descriptions would be complete, because every point would be taken up—at least every point would be suggested on the form.

The Secretary : I fully appreciate everything that has been said, and will take care of these notes of Prof. Saunders'. I would be in favor of a committee being appointed of himself and Prof. Craig to draft this for publication, so that we may have something permanent and something we can all use both in descriptions of fruit at the farm and in our Association, so that we can work together in harmony.

Prof. Craig : As a member of the Fruit Committee I have uniformly used Downing's plan in describing fruits.

Prof. Saunders . I have in my hand a paper which was handed to me by Mr. Shutt, our chemist, which, if you wish, I will read to you.

NOTES ON THE CHEMISTRY OF THE COPPER SALT FUNGICIDES.

By Frank T. Shutt, M.A., F.C.S., F.I.C.,
Chief Chemist, Dominion Experimental Farms.

The preservation of orchards, small fruit plantations and vineyards from their minute and often microscopic foes is a matter of great importance to those engaged in the fruit industry of Canada, and a subject not without interest to all lovers of a garden.

The value of certain copper and arsenical compounds for destroying these insects and fungus pests is every year becoming better known, so that the practice of spraying is now no longer looked upon by fruit growers as a scientific fad of doubtful efficacy, but rather as a sure and safe means for keeping both trees and fruit free from injurious attacks. Two years ago I wrote as follows, and the words will bear reiteration to-day:

"Properly applied, *i.e.*, at the right time and in the correct proportions, the copper fungicides have proved and are proving themselves to be of inestimable benefit in the orchard and in the vineyard. The increased value of the fruit has more than repaid, by a large margin, the outlay for spraying apparatus and materials and cost of application, and I believe the time has come when no fruit grower can afford to ignore this useful means of preventing fungous diseases. Next to the best important element in successful fruit-growing, now-a-days, is keeping in check fungous growths and destructive insects, and, for this purpose, our present hope lies in the application of arsenical and copper solutions. By the more extended use of them the hope is confidently entertained that the loss occasioned by injurious insects and fungi will be greatly lessened year by year throughout the Dominion."

The intelligent manufacture and application of these spraying solutions is better carried out if the fruit grower understands—at least in outline—the chemistry involved in their preparation. The object of the present notes therefore is to state though very briefly, the reactions which take place in making the more popular solutions and mixtures containing copper salts, in use as fungicides.

The source of the copper (the compound used), in all these preparations is primarily copper sulphate or bluestone—a deep blue, crystalline salt, easily soluble in water, the chemical formula of which is $CuSO_4$, $5H_2O$.

Since the efficacy of copper sulphate as a fungicide has been well established—as illustrated by its beneficial action on seed wheat infected by smut spores—and since it is the basis of the copper in the spraying mixtures and a material easily and cheaply obtained, the question is often asked "Why cannot a simple solution of bluestone in water be used for spraying?" The answer may be very briefly stated. A solution of copper sulphate sufficiently strong to prevent the growth of fungus diseases would, so far as our present experience shows, prove injurious to foliage. The corrosive character of this chemical must by some chemical means—precipitation or neutralization—be rendered innocuous before it can be of practical value for spraying when the leaves are out. For the initial treatment of apple and pear spot, Mr. Craig, Horticulturist of the Central Experimental Farm, Ottawa, says:

"Before growth begins in spring, spray with a solution of copper sulphate 1 lb. to 50 gallons of water."

But he also states,

"On no account should this be applied after the foliage has appeared, as it will severely injure it."

And again, for certain diseases of the grape, *e.g.*, downy mildew, black rot and anthracnose, the same authority says:

"Spray the canes with copper sulphate, 1 lb. to 50 gallons, before growth begins."

It is, therefore, evident that, save in exceptional cases, a solution of copper sulphate strong enough to be efficacious in destroying or preventing fungus diseases cannot safely be applied after the foliage has appeared. The solutions and mixtures about to be described allow the application of an adequate amount of copper, which at the same time is innocuous to foliage and effective as a fungicide.

Bordeaux Mixture.

This is perhaps the best known and the most highly valued and widely used of all the copper compound fungicides. Its formula, as now advocated, is as follows:

Copper sulphate (bluestone)	4 lb.
Lime	4 lb.
Water	50 gallons

Briefly, the directions for manufacture are:—The freshly burnt lime is allowed to slake and then well stirred with sufficient water to make a thin creamy mixture. This is now strained through coarse sacking into a barrel containing the dissolved copper sulphate and the whole stirred and made up with water to 50 gallons.

The lime in solution precipitates the copper from the solution of bluestone as an insoluble material (cupric hydrate), the sulphuric acid combining with the lime to form sulphate of lime, which on account of its slight solubility remains to a a very large extent in suspension. The reaction is represented by the following chemical equation.

$CuSO_4, 5H_2O$	+	$Ca(OH)_2$	=	$Cu(OH)_2$	+	$CaSO_4$	+	$5H_2O$
Copper sulphate.		Slaked lime.		Cupric hydrate.		Sulphate of lime.		

By reason of the slight solubility of lime—1 part in 750 parts of water— the fifty gallons cannot hold in solution at once the amount of lime necessary to precipitate or throw out of solution the 4 lb. of bluestone. Since, however, the sulphate of lime (see above) for the most part separates out as it is formed, the same water again takes up more lime, which further precipitates cupric hydrate. This reaction is continuous and rapid until all the copper is precipitated. Finally, we have insoluble cupric hydrate, lime (from the excess used) and sulphate of lime suspended in a liquid containing small quantities of the the two latter materials in solution. If sufficient lime has been added and the reaction is complete the liquid, after allowing the precipitate to settle, is colorless and should not give any brown precipitate if to a few drops a small quantity of a solution of ferrocyanide of potash be added—showing that all the copper has been converted into an insoluble form.

To precipitate a definite amount of copper sulphate, a definite amount of lime is necessary—at least 3.5 oz. of freshly burnt lime for each 1 lb. of bluestone. In practice, however, in order to ensure the complete precipitation of the copper, and since impurities always exist in the commercial article, an excess of lime is always used. No element of danger is in this way introduced, as the excess of lime is not injurious to foliage. It will not answer, as some have suggested, to use the supernatant lime water which can be poured off the undissolved lime—lime water in fact. Fifty gallons of such saturated lime water contain only sufficient lime to precipitate (practically) 2 lbs. of copper sulphate. As already remarked, it is owing to the sulphate of lime separating as it is formed, that fresh quantities of lime are dissolved, and can, therefore, react with the copper compound.

By the evaporation of the spraying liquid the copper is left upon the foliage as the hydrate.

Eau Celeste.

This fungicide is made by adding ammonia to a solution of copper sulphate.

The formula usually given for its preparation is:—

Copper sulphate	1 lb.
Strong ammonia	1½ pints
Water	22 gallons

The first action of the ammonia is to precipitate basic copper sulphate ($CuSO_4, 2Cu(OH)_2$) which, however, soon dissolves in the excess of ammonia present to form ammonium copper sulphate ($CuSO_4, 4NH_4OH$), a deep blue fluid. At the same time ammonium sulphate is produced and remains in solution.

The evaporation of the fluid leaves upon the foliage basic copper sulphate and ammonium sulphate.

Copper Carbonate.

If a solution of sodium carbonate (Na_2CO_3, $10H_2O$) be added to one of copper sulphate ($CuSO_4$, $5H_2O$), the copper is thrown down as a pale green precipitate. This is "basic carbonate of copper" (a compound containing both carbonate and hydrate of copper), and has the formula, $CuCO_3$, $Cu(OH)_2$. It dries to a light green amorphous powder. In the above re-action sodium sulphate (Na_2SO_4) is formed and remains in solution.

The precipitate of basic carbonate of copper may be washed by repeated decantation, and thus freed from the sodium sulphate. Remembering that the weight of basic carbonate formed is, approximately, half that of the copper sulphate used, the addition of the required amount of water makes the spraying mixture known as "copper carbonate in suspension," the formula of which, as recommended by Mr. Craig, is :

Basic carbonate of copper	5 ounces
Water	50 gallons

It is scarcely necessary to add that the form of copper salt left upon the foliage when dry is the basic carbonate ($CuCO_3$, $Cu(OH)_2$).

Ammoniacal Copper Carbonate.

This spraying fluid results from the solution of the precipitated basic carbonate of copper, just described, in ammonia, and subsequent dilution with the required amount of water. Two soluble compounds are formed, ammonio-cupric carbonate and ammonio-cupric hydrate, which on drying upon the foliage leave basic carbonate of copper and hydrate of copper, respectively. The formula recommended is :

Copper carbonate	5 ounces
Ammonia	2 quarts
Water	50 gallons

From the excellent results obtained by the use of this fungicide it may be inferred that this fluid presents the copper compounds in a form which is at once inimical to fungus life and non-injurious to foliage.

The fungicides, accordingly, fall into two classes. "Bordeaux mixture" and "copper carbonate in suspension." On the one hand, apply the copper in a more or less insoluble and precipitated form, while ammoniacal copper carbonate and Eau Celeste furnish it in solution. It is probable that the latter provides for a more equal distribution of the copper compounds on the leaves. From a chemical standpoint it might be inferred that the spraying fluids containing the copper in solution, if made according to correct formulæ and applied at the proper strength, would prove more efficacious than the fluids containing the precipitated copper, though a slight variation in the strength of the latter fluids would involve, in all probability, less risk of injury to foliage.

A part of this paper—that which refers to the chemistry of the Bordeaux mixture—was communicated to the Montreal Horticultural Society this year. The importance of the subject to fruit growers at the present time has induced me to complete the question of the chemistry of the copper fungicides and present the paper, thus extended, to this meeting.

RESOLUTION re FRANCO-CANADIAN TREATY.

Mr. McNEILL : I have a motion here that may call for a little consideration.

Moved by A. McNeill, seconded by A. H. Paris, that in view of the large amount of capital invested in the grape growing industry of this country, and the great possibilities of its further development, this association is opposed to any ratification of the Franco-Canadian Treaty, the provisions of which will most seriously affect, if not entirely destroy, this flourishing industry.

Mr. McNEILL : I ask your favorable consideration of this resolution, I think on very fair grounds. While we are all united on fruit growing, it is possible that we are

not all equally interested in every department of it. For instance, at the present time I am not at all interested in apples, commercially; I am not interested in plums; but, nevertheless, I take a deep interest in these fruits, and in acting with you here would act as if I were personally interested in the growth and sale of this particular fruit. It is the only way we can act, and I believe each one of us should look at the interests of each other here as if they were his own. I trust you are going to look at the grape interest as if it was your own interest. The report given by Deputy-Minister James the other day rather astonished some of us. He reported that there were at least 2,236,000 grape vines in Ontario alone, and if I mistake not another 2,000,000 were coming into bearing, so that within a very short time we will have over 4,000,000 grape vines here in Ontario. When we talk of millions we are getting into exceedingly large numbers, and an industry of this kind calls for very careful consideration. You can easily see, putting it plainly, that the total grape industry is positively and practically overdone under those circumstances. If all the product of these four million vines were to be put on the market at once in Ontario it would simply swamp the market. There is not anything like one-half that put on at present, and the market is exceedingly low. The provisions of this treaty are such that if it should pass it will most seriously injure—it would actually destroy—a very large portion of the grape industry in this Province; only those districts most favored as to soil and market and climate would be able to grow grapes at all. Hundreds of acres of vineyards will be plowed up if this treaty should ever become a settled fact. Now, as we are here to look after the interests of the fruit-growers, I think it becomes us to take such steps as we can on this subject. It is not a political subject; it is purely and simply a fruit-growers' question, and as such I submit it to you. After giving the matter careful consideration and looking at the magnificence of this industry, I have come to the conclusion that it is necessary that we should use all our best endeavors to prevent the passage of this treaty, or at least to express our opinion upon it. I trust you will pass this resolution without a dissenting voice.

Mr. M. Pettit: I think Mr. McNeill has pretty well covered the ground. There is no doubt that the ratifying of that treaty, or not doing so, is of the utmost importance to the grape growers of this Province. We all know that Montreal is the great outlet for the grape crop of Ontario, and hundreds of carloads of grapes that are shipped to Montreal are not used for dessert purposes. Well, from a prohibition standpoint, if our people in this Dominion will drink wine, why not grow the grapes in our own Province and manufacture pure native wine here, rather than import from a foreign land, paying thousands of dollars to support an industry in another country? I think that if this Association should remain in silence and not take steps to protect this very important industry it would fall far short of its duty. There is no question we have the soil and the climate and the people to manufacture all the wines, and as good wines as our people will ask for, and we are credibly informed that they can be laid down from the south of Europe—from France—so cheap that our manufacturers here cannot compete. Whether it is pure juice of the grape or not is another question; but if people drink wine, why not manufacture it ourselves—the pure article—in our own country? (Hear. hear.)

The President: The desirability of this resolution coming before this Association is this. We find that our Dominion authorities, since they have found out what a large interest this proposed French treaty is going to seriously effect, are disposed not to ratify it. It was not known before that the grape-growing interest of this Province especially, was anything like as large as it really is. We believe a resolution of this kind, going from this Association, will largely strengthen the hands of the Dominion authorities in their disposition not to ratify this treaty.

Mr. Caston: Of course we should look at these things in a broad sense—not in a selfish light at all. Are there any advantages to be derived to the country at large from this French treaty that would compensate for the loss that we would sustain by their wines coming in competition with ours? Those who were at Brantford last year can bear testimony to the great excellence of the product of Canadian wine there. I don't think we could get a better or healthier product elsewhere. People will use it.

The President: It is not a question for us to consider as to whether wine is a good article or not, from a temperance standpoint. We know that there is a great deal of

wine consumed among our French neighbors in the Province of Quebec, and that wine is largely manufactured now from the grapes grown in Western Ontario. We have no more right to consider the matter of the wine than the Farmers' Institute has to consider the matter of the ale made from barley. We, as an Association, are interested in the production of fruit, and grape-growing is one of the largest branches of fruit production at the present time in the Province of Ontario. We want to increase it, and we cannot say whether you are to eat the grape or drink the juice of the grape; and we believe if wine is made from the grapes, it is better to have that pure wine than to have the spurious article brought in from France to supply the French appetite. That is the whole subject in a nutshell. Prof. Saunders, have you a word to say on this matter?

Prof. Saunders: I don't know that I have anything special. I fully realize the difficulty that the fruit growers of this country would be in in competing with wine made in France. In going through the wine-making districts of France some six years ago, I ascertained that the ordinary price of labor in the wine district for good workmen was about two francs a day—about forty cents a day; and as we know, the cost of transportation is so little it is scarcely likely that our people here could compete with wine-makers there on account of that great difference in the cost of labor. Whether we can produce as many grapes to the acre here or not, is also a question that perhaps would elicit some difference of opinion. The regular plan of growing there is the stake system—about four feet high, about two feet apart in the rows. It is just possible that they may have the better of us somewhat in their climate, and be able to produce more grapes per acre. They certainly have a great advantage in the matter of cost of manufacture, on account of the cheapness of labor; and that is a point that wine growers of this country could not possibly get over. Of course I can say nothing on the merits of the treaty. I am not sufficiently conversant with it in a general way.

The President: We do not wish to rush this thing through without giving everybody an opportunity to say a word. It is a matter that touches the temperance question, also the question of the tariff; so for that reason we do not want to rush it.

Mr. Hilborn: In looking at it from a temperance standpoint, I think we should try to keep out these cheap wines. I do not see any other view to take in the matter. We do not want these cheap wines here. If we have any wines at all we might just as well have our own wines, even if they do cost more.

The resolution was then put and carried.

Mr. Trotter: There are two gentlemen here who have been engaged in raising plums and cherries for some time in this locality, and I think successfully.

The President: We would like very much to hear from them. We have had nothing about cherries and plums from this quarter.

Mr. Robert Fife: That you may not go away with the impression that we cannot grow cherries and plums around Peterboro', I will give you a short statement. It is eight years since I planted my first plums—about forty Imperial Gage—and three years ago I had my first crop, two years ago my second, and a year ago last spring there was none. This last season I picked about one hundred and sixty baskets. Later on I planted other varieties—altogether about one hundred and twenty trees. There are quite a number not bearing. I have had quite a success in cherries. I had about twenty-five baskets of various kinds this last season—eight or nine different kinds—some that are called tender, and yet they succeed very well. I planted Montmorency, Louis Phillippe, and Governor Wood. The latter turned out very good.

The President: Did the Imperial Gage have black knot with you?

Mr. Fife: No, not very much. I have not been troubled very much with black knot. There was a little on my cherry trees, but I guard against it as much as I can. Where I live there are people growing a tree or two in their gardens, and they don't keep it off, and no doubt it inoculates others.

Mr. Boulter: How do you keep it off?

Mr. Fife: I take the surest way—I cut it off and burn it.

The PRESIDENT: Did you ever try spirits of turpentine?

Mr. FIFE: Yes, but I could not say it checked it. I saved one fine tree by using coal tar, and it is doing better now than it did before. The Pond's Seedling plum I find is a fine bearer and grows well. It is thin, but you cannot expect to grow heavy crops on account of the size of the plum. It does not rot as badly as some others. I think the Imperial Gage would succeed best in this locality, with a man that was very attentive. They are like many other things—if you don't feed them you are not going to have much.

Mr. BOULTER: Have you tried the blue Damson plum?

Mr. FIFE: No. I have tried the Shropshire Damson. It does well.

REPORT OF COMMITTEE ON EXPERIMENTAL STATIONS.

Prof. CRAIG: I wish to make a verbal report from the Committee on Experimental Stations. The Committee met this morning, and considered the question very carefully, and have formulated in part a scheme for carrying out the work, but have not had time to bring it to such a stage of completion as to allow it to be presented to the meeting at this time; but I may say that they are a unit on the manner in which the work may be carried out, and would ask the indulgence of the Directors of this Association in the matter of time for further preparation and formulation of this scheme, which will be done by correspondence as quickly as possible. Their idea is to formulate a scheme as far as possible and submit a copy of it to each director for their approval and sanction, and for the directors to take such action afterwards as in their wisdom they see fit. If you approve of that, it would be necessary to continue the work of the Committee till such time as the final report is brought in.

The PRESIDENT: I think it would be as well for this Committee appointed last night for that purpose to be made a Standing Committee till they are able to report.

The SECRETARY moved that this report be received, and that the Committee continue their work.

Mr. BEALL seconded the motion, which was carried.

Mr. M. PETTIT: I would move the appointment of a deputation to urge the necessity of these resolutions we have just passed concerning the French Treaty, and if necessary interview the Government in reference to them; and I would suggest Mr. McNeill, Mr. A. H. Pettit, and Mr. Boulter, as that committee.

Mr. TURNER seconded the motion, which was carried.

PETERBOROUGH AS A FRUIT-GROWING COUNTY.

By E. B. EDWARDS, PETERBOROUGH.

This County, situated as it is between 44 and 45 degrees of latitude, and at a distance from and considerably above the level of Lake Ontario, has a severe winter climate, the thermometer frequently reaching from ten to twenty below zero, and rarely from twenty to thirty below. The air is, however, usually dry, especially with a low thermometer, and the winter is generally uniform, while the snow commonly covers the ground to a depth of from one to two feet, from December until the middle or latter part of March. The summer weather does not differ materially from that of other parts of Ontario, so far as its effect upon fruit-growing is concerned. The effect of the severe cold is to destroy the more tender fruit trees such as the peach and some varieties of cherries, plums, etc. But apples of nearly all the best varieties, many kinds of plums, pears, cherries of the Morello variety, grapes of some early varieties, raspberries, gooseberries, strawberries and currants will grow in this climate. Grapes, of course, require to be laid down in winter, and raspberries, the blackcaps especially, are generally laid down, and strawberries are also usually covered.

Granted that the fruits I have named will grow here, if I am asked the question, "Is Peterborough a fruit growing county?" I am compelled to say, "It is not." If I am asked the reason why, I can give no better reason than to put it down to want of knowledge in the first place, and want of enterprise in the second.

In all the townships of this large county there are, according to the municipal statistics, only 1,900 acres devoted to the orchard and garden. In North Monaghan, with a total of nearly 14,000 acres there are 162 acres of orchard, or one in 86, the best showing as to percentage in the county. Douro, with 38,000 acres, has 285 acres of orchard, or 1 in 135; Smith, with a total of 57,000 acres, has 401 acres of orchard, or 1 in 144; Otonabee, with 64,000 acres, has 400 of orchard, or 1 in 161; Asphodel has 209 acres of orchard, being 1 in 180; Ennismore, 86 acres, or one in 199; Dummer 205 acres, or one in 321. The average of these, the seven best townships in the county is 1 acre of orchard and garden to each 169 acres. The other townships have such a small proportion of orchard that they may be quite left out of consideration, and in fact it would be unfair to take them into consideration, as they do not compare with the other townships in the quantity of arable land. Pursuing the investigation a little further, we find that Asphodel has 21 farmers who have 2 acres and upwards of orchard, Monaghan, 47, Otonabee, 76, Smith 70, Douro 19, Ennismore 1, and Dummer 28, or 262 owners in the 7 townships have 2 acres each and upwards. The number who have more than two or three acres is very small, while probably not a half a dozen in the whole county have as much as ten acres each.

Taking the adjoining counties for the sake of comparison, the county of Northumberland has 6,858 acres of orchard, being an average of one acre in every 63 acres for its 9 townships. The townships of Cramahe is the best, with 1,245 acres of orchard, or 1 in 37 of its total acreage; Haldimand 1,240, or 1 in 61; Brighton 1,012, or 1 in 48; Hamilton 886, or 1 in 69; Murray 798, or 1 in 60; Percy 740 or 1 in 72; Seymour 633, or 1 in 98; Alnwick 158, or 1 in 105, and South Monaghan 146 or 1 in 125.

In the county of Durham, with 6 townships, there are 3,794 acres of orchard, or 1 in 57 of the total acreage. The township of Darlington has 1,183 acres of orchard, or 1 in 57; Clarke 801, or 1 in 85; Hope 725, or 1 in 88; Cavan 467, or 1 in 136; Manvers 330, or 1 in 211; and Cartwright 288, or 1 in 128.

In the county of Victoria the showing is not so good, there being only 1,525 acres of orchard, or 1 in 276 of the total acreage of the seven townships which make any returns of orchards. The township of Ops has 358 acres of orchard, Mariposa 340, Fenelon 259, Verulam 205, Emily 152, Eldon 121, and Somerville 90. In the best township the percentage is 1 to 156, and in the poorest of the seven one to 680 of the total acreage.

It will thus be seen that Northumberland has three and a half times the acreage in orchard that Peterborough has, and Durham over twice that of Peterborough. Victoria on the other hand being 375 less than Peterborough.

As to the extent to which the different fruits are cultivated: Currants, gooseberries, raspberries and strawberries are generally grown by each individual for home use, a few market gardeners growing them for the local market, but there are considerable quantities brought in for sale from outside places. They grow as freely and as well here as elsewhere. Grapes are not generally grown. The local market is largely supplied from the Niagara district. A few small vineyards exist, chiefly in the neighborhood of the county town. As a rule it is hard for local men to compete against the growers of more favored localities. Having regard to the question of climate, the competition from outside and the constant care required, it does not strike me that farmers in this county can successfully grow grapes for sale. But there is nothing to prevent any farmer having half a dozen vines for home use, of such varieties as Niagara, Brighton and Agawam. Cherries are little grown in this county, the Heart cherries not standing the climate. Plums are not grown to any great extent, but in the adjoining township of South Monaghan they are largely grown, the conditions being exceedingly favorable, and this township largely supplies the local market. Pears grow fairly well here, such kinds as Flemish Beauty, Bartlett, Clapp's Favorite, Lawrence, etc., generally succeeding, but of late years there has been serious trouble with the blight. There are no large pear orchards.

Whatever may be said of other fruits, it is quite clear that Peterboro' can grow apples as well as any other place in the world, and it is in this direction that there is room for systematic development. It is not necessary to seek for Russian or iron-clad varieties to stand the climate. The best standard varieties can, with a few exceptions, be grown here, and there are at all events varieties sufficient to form a first-class commercial orchard. And yet the great difficulty has been that people have put in too many poor varieties, too many early kinds, and too many kinds in any case. The result is that, so far as I am aware, there is not in the county a single orchard which can be said to be a satisfactory commercial orchard. There is consequently nothing to attract the best buyers or to make it worth while for the owner to ship his own fruit.

The Northern Spy is perhaps the standard apple in this section, and one that attains here a fine growth and flavor. The Duchess is also a great favorite, and is very fine in coloring and flavor for cooking purposes. The Fameuse or Snow succeeds fairly well, being fine in size, color and flavor, but it is inclined to spot badly some years. The Russet also succeeds well. With the writer the Blenheim Orange is in all respects the most satisfactory apple, the tree being vigorous and healthy, a regular bearer, and the fruit being largely first-class. Another satisfactory apple is the Canada Red, which appears to me to resemble the Pomme de fer of Quebec. It is generally free from spots or worm holes and a good keeper. The Rhode Island Greening is not in general very successful in this neighborhood, although I have a number of trees of this variety 25 years old. The King of Tomkins County attains a fine size and coloring here, but the tree does not bear freely nor regularly. The Ontario has not been sufficiently tried here. An objection is made that the tree is not a good grower. Wealthy promises to be very successful in this section. Pewaukee and Mann will be very useful on account of their keeping qualities and hardy growth. I have not pretended to exhaust the list, but each grower seems to have his favorite variety, and in any case there are, as I have said, varieties enough that can be successfully grown to satisfy the wants of all.

To sum up, I desire to emphasize the following points :

1. Peterborough county is well adapted to growing apples of the best varieties and possessing the best keeping qualities, the highest flavor and the richest coloring.

2. It will pay to grow winter apples for export, and the returns will average at least twice the returns of any grain crop that can be raised on the farm, and with less labor.

3. I would not encourage the average farmer in this county to grow for sale any other kinds of fruit, or to grow for sale summer or fall apples.

5. A decided advance is necessary before our county can be considered a fruit growing county. How is this to be accomplished? Let me suggest a way. I would like to see 200 progressive men in this county who have suitable land, resolve to have a commercial orchard of ten acres each. To accomplish this successfully I would recommend them to combine to purchase trees from a reliable nurseryman, getting the best stock on the most favorable terms, and planting a limited number of varieties that are found to succeed best in their respective neighborhoods, regard also being had to the prospective market. I would recommend the planting of say 100 trees each the first year, 150 to 200 the second year, and the balance the third year, the whole ten acres being thoroughly and carefully worked each year with a view to its future use. The cost for trees and planting them need not exceed $8 to $10 an acre, even if men have to be hired to plant them. For a number of years hoed crops could be grown to advantage in the land, giving a present return for cultivation. The cash outlay for ten acres would be from $80 to $100. I think I am well within bounds to say that in ten years these ten acres will have increased in value by at least $1,000. I think I am also within bounds to say that in 15 years they will be bringing an interest on a valuation of $5,000 for the ten acres, over and above all expenses for labor. This would only a little more than double our present acreage in orchard. But the new orchards would easily be worth four times our present orchards in producing power, and at least a million dollars would be added to the value of the farms on which they would be growing. If we cannot get 200 men we must be content with fewer, but there is no reason why the number should not be doubled or quadrupled.

The PRESIDENT: I consider this a very valuable paper. It gives an amount of reliable data rarely obtained in such a concise way.

Mr. CASTON: I was going to ask Mr. Edwards where he got his figures.

Mr. EDWARDS: From the assessment roll. I would not recommend farmers to give up their farming and go in for fruit raising altogether, because in most cases the farmers in this neighborhood, I know, are not posted in the work of looking after an orchard, but it strikes me that if they would have a definite object before them, which would be within moderation, and go at it deliberately and slowly, they would soon have an orchard that would be worth while, and get over one of the difficulties that exist at present—that we do not attract buyers to come in here and take our apples away. Our local market is overcrowded; we have not enterprise to supply the foreign market satisfactorily, and the trouble is, we are just treading on each other's toes here in the town, and farmers, finding that they cannot sell apples, decide to sacrifice them at any price. Perhaps they are shaken down from the trees and brought into the local market. The result is that they do not bring their fair value, and there is no one to come in and buy what they have worth while.

Mr. CASTON: This is a very valuable paper, and suggests many lines of thought on the apple industry. I think there is nothing on which farmers need so much light as on the cultivation of orchards. They do not give them proper care. They need to realize that the orchard will pay them more, acre for acre, than anything they can produce on the farm even when they get $1 to $1.25 a bushel for wheat. But how are we to get that information to them? They do not attend our meetings, or the Farmers' Institute meetings as they ought, they do not take the *Horticulturist*, and a good many do not take the agricultural papers. There are many other parts of the country the same as here—they grow too much for the local market, yet not enough for export. There is no apple that will earn so much money as the Wealthy, if picked early—by the last week of September—and you have a market that will take them then. Then we have the Pewaukee. I believe a great deal in the importance of this top grafting to grow some of our commercial apples for markets abroad. In any county of Ontario, except in Algoma or Muskoka, we can grow any apple that can be produced in the Niagara district or anywhere else, by simply top-grafting them on good hardy stock. I have a theory that it is nearly always the trunk of the tree that peels, sometimes from sun scald, bursting of the bark, or disease. In 1884 immense numbers of trees were lost by being frozen to death in the crotches of the branches. Now, we find certain varieties that have been perfectly hardy for years even in localities where the temperature goes down to 25° and 30° below zero. Then if we take the trunk of that tree and get above the point of attack, and introduce the varieties that we want to grow in the limbs, we will succeed. I have proved that from my own experience. There is not a King of Tomkins or a Rhode Island Greening living that was planted in the usual way 25 or 30 years ago, but I have them growing grafted to Siberian trees, and I find they produce more than they do growing on the original tree, and far finer specimens. It is important, in planting out new orchards, to select some of those hardy standard varieties, and as soon as they get large enough graft some of our good apples on them. I would be disposed to regard the Wealthy first as a winter apple; but now I cannot do so—it is a fall apple.

Mr. A. H. PETTIT: I have been quite interested in Mr. Caston's theory of top grafting, but I do not think his premises are altogether sound. Taking for instance a Tolman Sweet, and graft the Duchess or some other apple on that, and I have no doubt that for a few years, with the cut-back that tree has received, and with the top graft, it will soon begin to bear, and bear quite profitably; but I believe the graft at the top will be no better than the tree that was originally grown, for this reason: I have in my orchard grafts on seedlings that were grown for 25 or 30 years, and I do not see that those trees grow a bit better than other trees planted from the same varieties, grown on their own stock. You graft the Northern Spy on the Tolman Sweet. The Northern Spy is a rapid and strong grower; the Tolman Sweet is not so much so. The trunk on the Northern Spy will be at least one-third larger in circumference within two feet from the ground than the Tolman Sweet, and vice versa. I think there are some matters that are not fully matured on that theory yet.

Mr. Caston: The great trouble is, people don't begin soon enough. You want to begin on a tree while it is young; and I know specimens in my own locality that have been grafted 10 or 15 years—King of Tomkins grafted on Talman Sweets. In about three graftings you want to complete the top. I do not know of any stock better for grafting on than the Haas.

Mr. Pettit: Do you graft so as to throw the tree into bearing?

Mr. Caston: No, simply to get a hardy stock.

Mr. Caston: It is extra hardy in our locality.

Mr. Boulter: It is certainly gratifying to me to hear from Mr. Edwards' paper that this locality produces as much fruit as it does. It is encouraging to the Association to know that you have been so successful.

NECESSITY FOR A CHANGE IN OUR METHODS OF OBTAINING AND INTRODUCING NEW VARIETIES OF FRUIT.

Mr. Thomas Beall, of Lindsay, read the following paper:

New varieties of fruits are obtained in different ways. Mostly, however, from accidental seedlings of supposed superior merit which are often found in localities where our staple fruits are grown. The merits of such seedlings are first decided on by the individual taste and knowledge of the finder. For many years past the first move towards bringing such varieties to public notice has generally been to bring samples to the notice of the Fruit-Growers' Association, where it was subjected to the scrutiny of a committee, composed mostly of experts, who reported thereon at the next meeting of the Association. These reports have, until recent years, been very interesting papers, inasmuch as they bore evidence of careful scrutiny, considerable knowledge of the subject, and commendable courage in their outspoken criticism. For while commending what was commendable they courteously put an extinguisher on the many varieties that were without merit.

Of late, these committee reports are of a very different character. They are simply a list of whatever there may be on exhibition. There is nothing specially commended and nothing disapproved of. Perhaps these committees recognize the fact that the result to the public will be as formerly, viz.:—That they will assist in making a show in the annual report as well as the former, and, that as the Association takes no means whatever to preserve any record (in convenient shape) of the excellencies of any varieties, all would go down to oblivion together.

Perhaps there is no branch of the business of fruit-growing which interests the great majority of fruit growers more than that of "new varieties." For whenever a new variety, or what purports to be a new variety, is brought to their notice, especially when sufficiently puffed by nurserymen's agents with the assistance of gorgeously colored prints, and, provided the prices named are high enough, the sales made are generally of sufficient extent and magnitude to amply recoup the enterprising nurseryman.

A retired nurseryman of Eastern Ontario, well known to many persons in this assembly, and much respected by all who do know him, says that more money is paid away every year by the people of this province for high-priced worthless nursery stock than would be sufficient to pay the interest on our national indebtedness, and I believe his statement is true.

A nurseryman's catalogue was lately received by me which seems to "cap the climax" of this mode of advertising. A new apple called "Springdale" is introduced, and, *as advertised*, seems to be the most useful apple yet produced in any country. It is said to be of large size, measuring between four and five inches in diameter; beautiful in color, of fine flavor; a winter variety that retains all its good qualities until the following spring, even after being used to fill up the mud holes and ruts on the farm during winter. All these and other excellent qualities are vouched for by a certificate from the "Hon. W. G. Vincenheller, Arkansas State Commissioner of Agriculture," who, after

certifying to many of its good qualities says: "Freezing does not injure the fruit; ate them last spring, after they had been run over by waggons and left all winter half buried in the ruts, and yet still sound and of fine flavor." It seems almost too absurd to think Canadians can be gulled by such advertisements; but such trash would not be circulated if it did not pay.

Much valuable time and a great deal of money has been spent in endeavoring to obtain from North-western Europe varieties of winter apples superior to our own for foreign shipment. For some years past our reports and our journal have been crowded with descriptions and illustrations of new Russian varieties of fruits of all kinds, but as far as I can learn no winter apple has yet been found to equal the varieties already grown here. And the fact that none of our best winter varieties have been obtained from more northern or colder countries than this should have been sufficient long ago to have caused a discontinuance of these costly experiments in pomological research.

On the pages of our *Horticultural Journal* there may be found strong commendations of varieties which a practical public had long before found unsuited to the peculiarities of our climate. The first article in the November number is an example. Here the McIntosh Red apple is described as "a seedling of great value," a "winter variety," surpassing the Fameuse in "coloring, size and quality," and also as being a variety underrated by the committee on apples because of its being a "new" variety. To all of which is added a certificate of character from Dr. Hoskins, of Vermont, who is the writer says) "the best authority we have on hardy apples," stating it to be "the best and most beautiful apple of its season." Now, it is not a very "new" variety. It was described in Downing some twenty years ago. Ten years ago the editor of the *Canadian Horticulturist* said of it: "It is known in Western Ontario, but the fruit is so very subject to the black scab that it cannot be profitably grown at present." In 1884 Mr. McIntosh, who is a nurseryman, said he had been propagating from the original tree for fifty years. It can hardly be said to be of "great value," because of the two serious blemishes in its character, also referred to by the writer of the article in question; viz.: Its great liability to "scab" and the unusual tenderness of its fruit buds. It has been tested largely throughout this Province during the past twenty years, yet none of the four or five hundred fruit growers to whom application was made by the committee on apples for lists of varieties most suitable for cultivation in this Province recommended this variety.

During the past two years a few hybridized varieties have been introduced, having so many of the necessary qualities requisite in fruits for commercial orchards that little doubt exists but this method of obtaining new varieties excels all others in the certainty of its results. If this method of procuring new varieties is so very good it may well be asked why it is that so little is heard of hybridizing or cross fertilization lately. I believe the chief cause is that, while a number of nurserymen have made large profits and the whole Province has been greatly enriched by growing some of these varieties, the originators—those who have spent many years in the production and development of these varieties—have received no reward therefor, and but little encouragement either from the public or from this Association. No doubt a few persons may continue to experiment in this most attractive branch of horticultural science, but since it is so well known that no pecuniary reward may result to the originator of a valuable new variety we may not hope for much of that energetic, persistent and continuous effort which ensures success.

I have endeavored to show some of the causes of want of success in introducing new varieties, which, briefly, may be summed up thus:

1. A great many of the new varieties which have been brought to the notice of this Association during the past twenty years, if we are to believe the committees' reports (and there is no cause to doubt their accuracy), possessed qualities which might have resulted ere this in displacing some of those now on our list, but which, through the neglect of this Association to keep a convenient record of such varieties, are now forgotten.

2. Nurserymen are always ready to acquire new varieties if anything in their line, but nurserymen are mortal, and therefore work for their own personal gain. The fewer

the number of new plants the better for them, but of these they require absolute control. So far, all is well. But, as already shown, the profit to them is often in proportion to the exaggeration used, hence no dependence may be placed on their catalogues.

3. Bringing varieties to public notice through the columns of the *Horticulturist* which are not equal, and often inferior, to varieties on the authorized list of this Association, is very misleading and annoying to the public, and therefore of great injury to the Fruit-Growers' Association. It should be thoroughly understood that no new variety of fruit can obtain a prominent place in public estimation until the fact is established beyond doubt that it is superior to some one, at least, of the established varieties as given for the various districts of Ontario

4. The fact that nothing has been done, or is doing, by this Association towards securing suitable compensation for successful results in hybridization is a reproach to this Association, and is perhaps the chief cause of the decreased interest in this, the most important branch of practical pomology. The following sentence from page 121 of Annual Report of 1892 is worth quoting in this connection: "But if students in this branch of science were assured that extraordinary success would meet with corresponding reward, men in early life having the necessary educational training would engage in this pursuit, and pomology and horticulture would soon be elevated in our country to that position in the scale of natural science which its importance deserves."

Perhaps it may not be out of place here to suggest a remedy for this state of affairs for the future, and possibly regain somewhat from the past.

A committee might be appointed, which should be permanent in its character; viz.: It should hold its position from year to year, or until changed by the Association, and should be in addition to the usual fruit committees. This committee should take cognizance of all matters relating to new varieties of fruits, such as to revise and condense after publication all reports of committees on new fruits; revise and condense all lists of fruits from year to year; summarize all the work of the Association for the past and preceding years relating to new fruits; originate or take into consideration any scheme which may have originated elsewhere for the better conduct of this branch of the business of this Association, and report at every annual meeting. This committee, for the better prosecution of their work, should consist of three persons only, who, in addition to having some knowledge of fruits, should have a fair knowledge of public business. And, also, it should have the power to appoint from time to time sub-committees of experts for each kind of fruit, who would report to the permanent committee as may be required.

Mr. PATTISON: I hardly think it advisable that rewards should be offered to introducers of new fruit. I think they stand very much in the position of inventors who patent articles and thus obtain the right over that article. It is found that although no reward is given for new patents the market, as anyone can ascertain by examining the records, is simply flooded with new patents for every imaginable kind of thing, the great majority of which are worthless and die a natural death. I think there are plenty men who will undertake hybridizing and offering new fruits from simply the love of the occupation. Then, again, if the new fruit is good and properly introduced there is no reason why the producer should lose control over it until he makes a good bargain with some nursery—they are always ready to make a bargain.

Mr. EDWARDS: I do not agree with that last suggestion. I think Mr. Beall's view is thoroughly good, because the policy of this Association and of the fruit-growers of Ontario has always been a liberal one. It has been in the direction of spreading knowledge, on every new point, through the whole country, and it is in that direction I think, a notable success should be rewarded—not everything, but where there is a decided success the Government should assume it and spread it throughout the country. Now, you cannot protect trees and things of that sort as you can patents, because every tree that goes out into the country produces its own scions, which may be budded on every tree in the orchard.

The SECRETARY: Mr. Beall has unjustly criticized an article in the November *Horticulturist* about the MacIntosh Red. If I remember aright, it was there clearly stated that on account of its tendency to spot it was ruled out. Very fine samples of that apple were shown at the World's Fair at Chicago from the Province of Quebec.

Mr. PATTISON: The article is here; the tendency to spot was mentioned. It reads as follows: "How unfortunate that it has two serious faults; one, in that it scabs almost as badly as the Fameuse, and another in the fact that, while its wood is as hardy as the Fameuse or Wealthy, its fruit buds are more tender, so that in cold sections it becomes a shy bearer."

ASSESSMENT OF ORCHARDS.

Mr. EDWARDS: With the consent of the other members of the Legislative Committee, I would refer to the question of municipal assessment, so far as it relates to fruit-growers. I think that it would not be undesirable that some representation should be made to the Government with a view of authorizing, under the Assessment Act, the assessment of those parts of the farm that are devoted to the orchard and vineyard, in the same way that the rest of the farm is assessed—that is, acre for acre—instead of increasing the assessment where a man begins to increase his orchard. I think the increase of orchards should be encouraged. At the present time there is no provision in the Assessment Act to assess orchards otherwise than their full value, whatever the assessor may think that to be. I therefore move that a committee, consisting of Dr. Beadle and Mr. Wellington, with power to add to their numbers, make such representation to the Government as they may deem desirable with reference to the assessment of orchards and vineyards.

Mr. TURNER seconded the motion.

The SECRETARY: You might also add Mr. Allan to that committee; he is also in Toronto.

Mr. EDWARDS: Yes, I will add Mr. Allan.

Mr. PATTISON: Would it be just to the other farmers if, by planting an orchard on a piece of land, you raise the value of that piece?

Mr. EDWARDS: I think it would.

The PRESIDENT: It is a matter with many sides to it. We all know now that our assessment law is the most complex and complicated in the world.

The SECRETARY: In some cases property is lessened in value by putting an orchard on it, at least in the owner's opinion, because they are digging them out, and digging the roots out is no small job.

Mr. A. H. PETTIT: I don't think many orchards are being taken out in our country or any other country because we don't want them, but rather so as to plant something else that there is more money in.

Mr. CASTON: It would still be an orchard, all the same.

The PRESIDENT: What is your pleasure in the matter? There will be no expense.

Mr. A. H. PETTIT: I would move that Mr. Edwards be added to that committee, as one of the legal profession there, to unravel the knots. (Laughter.)

Mr. EDWARDS: The idea was that we should have men resident in Toronto.

The PRESIDENT: Is it a fact that the assessment has been increased in any three or four or five acres that have been planted as orchard?

Mr. EDWARDS: I do not think it is, but the assessment law recognizes simply the assessment of all land according to its actual value.

The PRESIDENT: I do not know any case where an addition has been made to the assessment in consequence of a farm having one or two or more acres of orchard upon it.

Mr. MCNEILL: I was a member of a township council some years ago when that very point came up. The Chapple farm, on the Sandwich River, was assessed at $75 an acre because it was one continuous orchard for some distance back. Fine, enterprising fellows had hold of it. There was a slovenly Frenchman right next to him, and he got off at $40 an acre, and the matter came up before us. What could we do?

The Frenchman's farm was not worth more than $40 an acre; the front of it had all been given away for gravel; and here was this farm in orchard assessed at $75, and well worth it. Still he grumbled, because he had improved his farm and the other man had made a wreck of his farm, that he should suffer for his neighbor. The other man's was costing the community just as much as his was, and he argued in that way.

Mr. Orr: I know I am paying twice as much as I was sixteen years ago.

Mr. Dempsey: I have a couple of acres of orchard assessed at about $100 an acre in the County of Prince Edward. If the farmers alongside were assessed at the same rate they would pay immense taxes. If my two acres had no orchard on it it would be assessed for $30 an acre.

The motion was then put and carried.

SOME DESIRABLE ORNAMENTAL TREES, SHRUBS, AND PLANTS, FOR PLANTING IN ONTARIO.

By Prof Saunders, Director Dominion Experimental Farm, Ottawa.

The love of plants, shrubs and trees is a general characterstic of civilized man, and there are few people who do not feel pleasurable impulses when they look upon beautiful shrubs and trees in the full beauty of their leafage.

Nature has indeed been prodigal in her generosity in the many beautiful forms which these noble objects present as found growing wild under varying conditions of climate and soil the world over. Man has long exercised his skill and energy in the production and cultivation of new forms originated by cross fertilization in which he appears as an original worker. He has also assisted nature by preserving the many singular and beautiful variations which occur as "sports" in plants and trees. Nearly all the modifications in the forms and coloring of the foliage of plants, shrubs and trees have occurred through these mysterious workings of nature, and under man's watchful care these treasures have been preserved and multiplied, and many new and beautiful forms thus made generally accessible.

For example we have many variations which have occurred in the common arbor-vitæ popularly known as cedar. In addition to the ordinary bushy form so beautiful in the woods of Eastern Canada, there is a stately pyramidal form in which the tree assumes the distinctness of outline and regularity of form of a pyramid of green without any pruning or shaping by the hand of man. As a strongly contrasting form there is the variety known as Little Gem, so dwarf in habit that it rarely grows much over an inch a year and seldom attains much more than a foot in height. It is indeed a little gem with its dense green foliage and slowly spreading form, for which almost every garden however small could find a suitable corner.

Representing the sports of this tree which are intermediate in character we have the dense rotund low growing form of globosa and Hoveyi with many others, some of which have the foliage beautifully arranged in regular laminated plate-like masses. Among the variations in form and character of the foliage are the Heathleaved and the Tom Thumb in which the foliage is much more finely divided, and among variations in color may be mentioned the Victoria with its silver tipped leaves also Aurea, Meehani and Douglas' golden with their various shades of golden yellow. All these have occurred as natural variations or sports, and man's agency has been of use in recognizing the value of these sports when produced and in preserving and propagating them.

It is astonishing what a volume of varied work is continually carried on in every direction in nature's laboratories, and the variety of products which result therefrom are most numerous and interesting.

The subject assigned to me as the basis for some remarks on this occasion is "Some desirable ornamental trees, shrubs and plants for cultivation in Ontario." Ontario is a large province, varying much in different sections in its climate, and as most of you will

naturally be more interested in those trees and shrubs which from their hardiness are more particularly adapted for growing in eastern Ontario, I shall with your permission confine my remarks on this occasion mainly to such varieties as can be successfully grown within this area. With this material limitation the subject is still a very large one. The climate at Ottawa is probably more severe in winter than the climate of this district, yet we now have on the Experimental Farm there in trees and shrubs alone nearly 600 distinct varieties, to which may be added about 150 hardy sorts of roses and many additional sorts are being added to both of these groups every year. The varieties of perennial plants of all classes would easily add 1,000 more to this already long list.

From this multiplicity of material I can only refer in the limits of such an address as this to some of the more strikingly beautiful and attractive things.

A question is frequently put to me by novices in this department—and the well-informed members of this Association will, I know, pardon me for referring to it—whether such and such a shrub is a flowering shrub. All shrubs are flowering shrubs, and all trees also which are hardy in this climate. In many instances, however, the flowers are small and inconspicuous and are not generally noticed. Some which are unattractive in flower are conspicuous in fruit, while others which make little show either in flower or fruit make amends for all other deficiencies in the beauties connected with their foliage and form.

Taking the subjects in the order in which they are placed on this occasion, trees will first claim our attention.

At the outset permit me to offer a word of caution and to enter a much needed protest. Enthusiasm in anything, however good, will often carry one to extremes and this is very frequently the case with tree planting for ornamental purposes. When our minds become awakened to the beauties and pleasures connected with this form of ornamentation, we want to crowd as many beautiful things as possible into the small space at our disposal.

In the planting of trees on any piece of ground due regard should be had to the placing of the different species so that the larger growing sorts which require many years of growth before displaying their full beauty should not have that beauty disfigured and marred by being so crowded that their graceful outlines cannot be seen and where the limbs soon begin to die from overshading. This can easily be avoided by planting the area surrounding such trees on the space which as growth progresses they are designed to occupy with such shrubs and dwarf forms of trees as will admit of being transplanted without injury to other quarters as the need arises for such removal. It is far better to have a few well grown shapely trees on a limited area or garden plot, whose gracefulness and beauty will be a constant source of pleasure to the owner and his friends, than to have ten times that number of different sorts, so crowded together that none can get the requisite sunlight and air for healthy development. Under such circumstances and burdened with the idea that it is almost a sacrilege to cut down a single specimen from among those which have had years of care, in order to give space for the admission of sunlight and air, we find the owner endeavoring to effect all sorts of compromises—taking the head off one specimen, lopping the arms off another and trimming up the lower branches of others until they are made to resemble the tiny trees in a Noah's Ark—a bunch of green on a piece of stick. By such management they all become disfigured and bereft of that beauty and grace with which nature has endowed them.

Evergreens.

Some of the more desirable forms of arbor vitæ have already been referred to and no collection would be complete without some of these.

Among the pines there are many beautiful sorts. One of the best is our native white pine, *Pinus strobus*, which should be planted of small size in order to produce the best results. When allowed sufficient space to develop they make handsome specimens, and they preserve their bright green color all the year round.

The Swiss or stone pine, *Pinus cembra*, is a slow grower, upright in habit, which makes a striking object and will content itself with a limited space for many years.

The Scotch pine, *Pinus sylvestris*, is a more upright grower with long dense foliage of a bright lively green in summer and of a good color in the winter.

The Austrian pine, *Pinus Australis*, is a medium grower also with long and dense foliage. It is a little more stiff in habit than the Scotch pine.

The yellow or bull pine, *Pinus ponderosa*, has very long foliage and a striking and distinct habit of growth. This tree deserves to be better known and more extensively planted.

The red or pitch pine, *Pinus resinosa*, has a more graceful and less rigid habit than the Scotch or Austrian.

The dwarf pine, *Pinus mughus*, and its somewhat larger growing relative, *Pinus Montana*, require but a limited space for their growth, and both make handsome specimens. They should be allowed to branch from the ground, and in a few years they become large globular masses of green of a most agreeable shade of color.

Among the spruces the common white and black spruces, *Picea alba* and *nigra* are well known, but their full beauty and symmetry are not often seen in the struggle for existence which they maintain in their native haunts. If you desire to get compact specimens of full symmetry begin with a tree not more than two feet in height and give space sufficient to admit of the young tree being bathed in sunshine and air, and nature will do the rest and in a very few years a specimen tree will be produced which will charm the beholder.

The balsam spruce, *Abies balsamea*, has rather too open and spreading a habit to make it very desirable as a single specimen, but in a suitable group with more compact growing sorts it may well find a place.

The hemlock spruce, *Abies Canadensis*, is one of the most beautiful and graceful of all evergreens and should not be overlooked. It is, however, difficult to transplant and for this reason is not always successful.

Among the spruces none is so striking and beautiful as the Colorado blue spruce, *Picea pungens*, and more especially those specimens with a distinct steely blue color to the foliage. This color varies in its intensity from a faint hue to one of a very decided and striking character. The blue color is most pronounced in the new growth in the spring, and as the summer advances it becomes softened and mellowed to a pale bluish green which contrasts strongly with the bright new growth when it pushes out the following season.

In connection with evergreens, I would say we have grown several of the Japanese Retinosporas at Ottawa without protection. The *R. filifera* is one of the hardiest and has never been injured by the coldest weather. The *R. Leptoclada* bears some resemblence to the arbor vitæ and is also hardy, but the most striking and beautiful of all the forms is *R. plumosa*. This has a delicate foliage, finely cut, and of a very feathery texture; and although not quite so hardy as *R. filifera*, has stood fairly well for the last four years A modification of this form, known as the golden variety of Plumosa, also does fairly well with us, and seems about equally hardy with that of the green form. Among the evergreen low growing shrubs—may be mentioned one of the Daphnes, which is very handsome and attractive, and has proven hardy in Ottawa. I refer to the *Daphne cneorum*. It grows about six or eight inches high, and has clusters of flowers which are delightfully fragrant, and the plant blooms for the greater part of the first months in the spring, and usually again in the autumn. We have had some difficulty in establishing some of the plants, and where the most pains were taken there has apparently been the least success, but one plant which was left in a very poor piece of sandy ground and never had any attention, has done remarkably well and made most vigorous growth. I believe it requires a light sandy soil to grow it successfully; but it is one of the best and most desirable forms of low-growing woody shrub that I know of.

Deciduous Trees.

Among the desirable deciduous trees there are many deserving of mention. The various forms of maple are very beautiful. The red and sugar need no comment, as they are known to all. They are very desirable as street trees and shade trees wherever there is room to grow them. A great many people, however, plant a form of the maple known as the silver maple (*Acer dasycarpum*) to a greater extent than is desirable, because it is soft and brittle in its wood, and when we have storms in winter and the branches get coated with ice these trees are almost always disfigured by the breaking of a large number of their limbs. Many call this the soft maple, and confound it with the

ordinary sort or red maple, which is a very much better tree, being tough, strong and durable. The form of weeping maple which is often planted as an ornamental tree, the *A. dasycarpum Weiri* of the catalogues, is a variety of this brittle western maple, which, although a very desirable tree, and very beautiful, when sound and perfect, is very liable to be injured and torn to pieces by winds and storms of the character to which I have referred. The Norway maple although well known in some sections, as I find, scarcely known at all in other districts. It is a very desirable tree very handsome in its growth and vigorous. It retains its foliage generally ten days to a fortnight longer in the autumn than any of our native species, and although it does not assume the beautiful colors which our red maple does, its handsome shades of brown and yellow, contrasting with the shades of the other species, lend a charm and variety to the autumn landscape. Another very pretty form, which in the woods is rather a striking looking tree, is what is called the Mountain maple, (*Acer spicatum*.) This is rather a large bush, or sometimes a small tree. Still it is worthy to be mentioned and to be included in a collection of trees of this character. There is a variety of the Norway maple, which is also desirable although not so hardy as the ordinary Norway maple, and that is the form known as *A. Schwedleri*. This produces deep colored foliage in the spring. The foliage is sometimes darker than the purple in the purple beech, although it is of a somewhat different shade of color. It retains this handsome purple color until the growth is pretty well advanced in the summer, when the color gradually fades almost to a plain green. Another form of maple which is deserving of cultivation to a far greater extent than it gets is the Pennsylvania maple (*Acer Pennsylvanicum*.) This makes a handsome small tree, and the bark is so beautifully striped with white bars as to make it strikingly ornamental not only in the summer but also during the winter months. Passing to the chestnuts, we do not find in Ottawa that the common form of European horse chestnut, *Æsculus hippocastanum*, succeeds well. It lives and struggles along, but makes very little growth and is very unsatisfactory; but that near relative of this species, known as the Buckeye which grows wild in Ohio, known as *Æsculus glabra*, is a very useful ornamental tree which passes with the uninitiated, very frequently as a horse chestnut, but when examined it is found to differ both in its leaves and fruit. There are several species of alder which make very pretty trees if nurtured, but unfortunately we have had introduced into this country an insect which preys on the alder. In Europe it is a small moth, which in the larval state works between the tissues of the leaves and makes large black or brown patches on the leaf, which causes the tree to look very unsightly. Hence, unless we can devise some means of reaching this little insect the alder trees are not desirable. To destroy this pest is exceedingly difficult, as it lodges itself between the upper and lower tissues of the leaves, and feeds inside on the soft tissues of which the leaf is formed. There is one sort of alder which seems to escape almost entirely the attacks of this insect, and I think that is partly due to the fact that the leaf is so finely cut that it does not give the opportunity to the insect to find a home sufficiently large to admit of its coming to maturity. I refer to the imperial cut-leafed alder (*Alnus glutinosa laciniata*), the leaves are of a beautiful shade of green, and are finely cut. Among the birches we have several remarkably handsome and beautiful trees—particularly the canoe, the yellow and the red birches. There are, however, none which attract so much attention for ornamental planting as that variety of the white birch of Europe known as the cut-leaf birch (*Betula alba laciniata*). This tree has proven hardy as far north as Brandon, Manitoba, where we have on the experimental farms one or two very nice trees growing thriftily. Very few of the deciduous trees which are common and hardy here will endure the climate there; but this is an exception, and is becoming a very popular ornamental tree for planting in that province. About Ottawa it thrives remarkably well. We have many of them on the experimental farm, and every year adds to their beauty and grace, and their long, pendulous branches sweep the ground with the murmurings of the wind in the summer time. The hickories are all very beautiful trees and compact in their growth. Among these, however, there are none better or more attractive than the ordinary soft-shelled hickory. Among the deciduous trees there is one of recent introduction to which I would like to call your special notice. This is from Japan, and is believed to belong to the family of magnolias. It is known as *Cercidiphyllum Japonicum*.

Coming from Japan it was not expected it would stand in such a climate as we have at Ottawa; but after five years' trial, in which it has never killed back an inch, to my knowledge at any time, I think we may fairly pronounce it to be hardy there. This is a rapid-growing tree, with heart shaped leaves which are dark green above and silvery green beneath. The leaf stalks are dark red and there is a tint of the same color in the veins in the leaf, which, contrasting with the dark brown of the young shoots gives the tree a very attractive appearance. Another tree, a native of America, which has its habitat in the more southern portions of this country, is also deserving of mention, as it has proved hardy in Ottawa after four years' trial. I refer to the yellow-wood *Cladrastis tinctoria*. It is a small-sized, round-headed tree, and has handsome compound leaves and sweet-scented flowers in June. The tree has not flowered with us yet, but it has made a regular and fair growth, and has not, to my knowledge, been injured by the winter. The beeches are more difficult to grow than most other classes of trees, and their growth is slow. The European beech seems to be fairly hardy. So also is the purple variety of this tree, commonly known as the purple beech. The Kentucky coffee tree (*Gymnocladus Canadensis*) sometimes supposed to be tender, but has also proven quite hardy in Ottawa. There are two large and handsome trees growing in front of Rideau Hall which must be forty or fifty years of age. We have found young trees planted on the experimental farm also to be hardy, and these trees have also been tested at different points in Ontario, and they have proven hardy wherever planted. Although of somewhat irregular growth when young, it becomes a tree of good shape in time. It has blunt shoots, with the extremities somewhat swollen, large compound leaves, and a rough bark. The Butternut (*Juglans cinerea*) is found native over a very large portion of Ontario. It is met with also in some parts of Quebec and extends down to the Maritime Provinces. The black walnut, (*Juglans nigra*) does not grow native over all of this territory, but we find as a rule it can be grown wherever planted, and is a hardy and very useful tree. So also with the Japan walnut—the *J. Sieboldiana*—which is a rapid-growing and handsome tree, and appears to be equally hardy with the black walnut or the butternut with us.

Mr. SMITH: Does the black walnut grow at Ottawa?

PROF. SAUNDERS; Yes, we have trees growing at the Experimental Farm five or six years old which have been grown there from the nuts, and they are quite hardy. I desire to call your attention to a tree which grows not only in the northern parts of Ontario but all through the north-west; that is the Negundo tree, *Acer Negundo* or box elder, and sometimes known as the Manitoba maple. It is a tree which resembles the maple very much. Sugar can be made from its sap in the same way that we make it from the hard maple, and this sugar is of very fine quality. In connection with our work at the experimental farms we have during the last three years distributed about five tons of the seed of this tree, this seed has been collected in the valleys and among the bluffs in Manitoba and the North-west Territories. Having called attention repeatedly to the value of this tree for that section of country, many people have the idea that it is a very desirable tree to plant down here. It is nothing of the sort. We have so many trees here which are very much better and more valuable that it is not desirable in my opinion, to undertake to introduce that tree for any general planting in the east. It sometimes makes a pretty specimen while young and thrifty, but it is not so handsome or shapely as our native maples. I mention this in this connection because every year I get scores of letters asking for seed of this particular tree, from people who reside in districts where all the better classes of trees can be grown. This tree would not be grown so much in Manitoba if we could grow there the hard or the soft maple or the Norway maple; but as it is one of the fastest growing trees for that section and is quite hardy, it is exceedingly valuable both for shelter and ornament. Among the small trees, or large shrubs, may be mentioned the hop tree, or wafer ash, which is covered late in the summer with bunches of seed vessels about the size of an ordinary wafer, and very much like a wafer in form. There are several species of mountain ash which also do remarkably well all through the northern and eastern parts of Ontario, the common European form (*Pyrus aucuparia*) also what is known as the American mountain ash (*Pyrus Americana*) and the oak-leaved form of the European mountain ash (*Pyrus aucuparia var. quercifolia*.) These are handsome and desirable trees, and grow well, and

are hardy all through this Territory to which I have referred; it seems to me, from what I have seen of these trees, that they fruit more abundantly in the colder portions of this Province than they do in the warmer sections. In some localities, during the early part of the winter, before the birds have got at them and thinned them out, the trees are sometimes covered with scarlet clusters of fruit. Among the oaks we have a number of varieties worthy of notice. One of the most desirable forms is what is known as the mossy cup oak (*Quercus macrocarpa.*) That is a species very widely distributed, growing not only through all the eastern parts of this country, but growing west, away up into Manitoba, and almost into the territories. The red and white oaks also deserve a place on large grounds. Another curious and interesting tree from Japan, which has been found hardy at Ottawa, is the salisburia or maiden hair tree (*Salisburia adiantifolia*). This was not expected to be hardy there, but it was tried with a number of other sorts, many of which have failed, and we have found it to be quite hardy, and it makes fair growth from year to year. I speak now, from four years' trial. We have trees that have stood four winters.

Mr. SMITH: Does not that bear some kind of a fruit or nut?

Prof. SAUNDERS: It does bear a nut of beautiful white silvery character on the outside, not so large as our native chestnut, but smoother and flatter in its form. I know of no instance where it has seeded very far north of Washington.

Mr. SMITH: I have one seven or eight years old, and have been looking for seed for some time.

Prof. SAUNDERS: There are some varieties of willow and poplar, especially some of those which have been imported from Russia, which are proving valuable as trees both ornamental and useful. They are all very rapid growers. The Basswood (*Tilia Americana,*) is also a native with us, and grows well as an ornamental tree. So does the European basswood, *T. Europæa*, which makes a smaller tree, more compact and pyramidal in form. All varieties of elm seem to succeed, and of these there are a large number, varying in form and color of leaf and bark; but it is scarcely necessary at this time to refer to them, other than in a very general way.

SHRUBS.

Coming to the question of shrubs, I would call your attention first to the False Indigo, (*Amorpha fragrans.*) I have a specimen mounted here to show you what it looks like when in flower. The flowers are deep blue, arranged along spikes. The shrub is about four or five feet high, and is well covered with these spikes of flowers early in the spring. Among the earlier blooming shrubs is the flowering almond (*Amygdalus nana*); although not perfectly hardy at Ottawa, we find it to winter fairly well; it generally gives a pretty good supply of flowers. *Prunus triloba* is also very handsome, only the flowers are larger. Among the barberries we have a number of species, among the more striking of which is the *Berberis Thunbergii*. In the autumn there is no bush that I know of that puts on a more brilliant hue in its foliage—not even the red maple—than is shown in this shrub. The Siberian Pea (*Caragana arborescens*), of which here is an example in flower, is another of the very useful shrubs which have been introduced within late years that has proven exceedingly hardy—so hardy that on the plains of the North West, where there is no protection whatever from the full sweep of the winds in winter, this shrub stands even better than any of the native species. So useful does this promise to be that a large number of these plants have been distributed from the Experimental Farm for test all through the North West Territories. We have also sent there a considerable quantity of seed for sowing, which has been brought out from Europe. These yellow flowers that you see here appear in May, at a time when few of the flowering shrubs are in bloom, and the bush, from the compound character of its leaves, and its general aspect, is very valuable and beautiful. There are several other species belonging to this same genus which promise to be almost equally hardy and useful, varying in size and character of shrub and flower; but we do not yet know enough of them to be able to speak with the same certainty that we can of this particular form. Another very handsome native shrub is what is known as the New Jersey Tea

Ceanothus Americana). This has spreading panicles and white flowers in June, that are very thickly clustered over the whole bush. As you find it growing in nature it presents more or less of a loose, straggling habit; when cultivated in the shrubbery border we find it assumes a very beautiful form, and is one of the most attractive of the low growing shrubs. The Button Bush (*Cephalanthus occidentalis*), which is found common in many sections, is also a very desirable shrub for general cultivation, and its curious globular flowers, coming in late in July, when most other flowering shrubs have done flowering, makes it an attractive object in the shrubbery. The Sweet Pepper Bush (*Clethra alnifolia*,) is another attractive shrub and an excellent bee plant. The various species of Dogwoods also claim recognition here, especially the Siberian Dogwood, *Cornus Siberica* and *C. Sanguinea*, of Europe. We have also some very handsome variegated forms of foliage among these Dogwoods which are well worthy of cultivation, especially the variegated *Cornus mascula* or Cornelian Cherry, as it is called in Europe. This list would be incomplete without some of the forms of Deutzia, of which we have several, which are half hardy in Ottawa. One of these, *Deutzia gracilis*, is hardy with us, probably for the reason that it is low growing and is thus covered with snow, which keeps it warm in winter, so that it comes out in the spring in good condition and flowers freely. The *Deutzia crenata*, kills partly back every winter, there is usually sufficient wood left alive to give a few flowers to start again, and we have found the Silver Bush Berry, *elæagnus argentea*, from the North-West exceedingly hardy and useful. The Forsytheas we cannot do very much with. They are handsome in their foliage—but rarely flower with us. The wood does not kill off, but the flower buds are killed almost every winter, except those branches that lie on the ground and are covered with snow.

Dr. BEADLE: It is often killed back in the Niagara District.

Prof. SAUNDERS: Of all the shrubs under cultivation, probably there is none that has attracted so much attention and given so much satisfaction as the Japanese Hydrangea, known as Hydrangea Paniculata Grandiflora, which was distributed by this Association years ago. This shrub is a charming one. It is perfectly hardy in Ottawa, and I have seen it growing as far north as Sault Ste. Marie in a garden that I visited there several years ago: I think it is hardy in almost all the settled parts of Ontario. It is a rapid grower, and produces at its tips every year large clusters of whitish flowers; they remain a long time open—three or four weeks a single flower spike will last—towards the end of this period they get dingy and pinkish in color; but for the first two or three weeks they are exceedingly handsome and attractive, and awaken more attention in the collection at the Experimental Farm from visitors than any other shrub that we grow. Quite unexpectedly we have found the tree Peony to be quite a success in Ottawa—the *Peonia Moutan*. It has lived for several years, and made very good growth, and, as far as we can judge, is quite hardy.

Dr. BEADLE: Because the snow covers it. It needs protection in the Niagara district.

Prof. SAUNDERS: Does it? Well, our bushes are now about two feet high, and they seem to pass the winters very well. Probably our snow saves it.

Dr. BEADLE: It may be that the freezing and thawing that it goes through so many times in winter in the west is the cause of injury there.

Prof. SAUNDERS: That is quite possible. We have winter, when it sets in, good and steady, and we like it much better than so many changes. The different species of Philadelphus, known also as Mock Orange, or Sweet Syringa, are very hardy and very floriferous. Among the plants belonging to the Sumach family we also have the Aromatic Sumach (*Rhus aromatica*), which is a hardy and valuable shrub, and the common form known as *R. glabra* and the cut-leaf form, of the same species (*R. glabra laciniata*). I must not omit to refer to a few of the Spireas, which are among the best of all the hardy shrubs. The *Spirea Van Houtii* and the round-leafed Spirea (*Spirea rotundifolia*), are two special favorites that I think should be in every collection. The mounted specimen shown here is covered with a mass of these small white flowers so thickly that you can see them when in flower from a long distance. The color of the flowers gives a character to the whole

bush ; and the same with the *S. Van Houtii*, which is even more floriferous. Among the other sorts that should be named is *S. Bumalda*, a very handsome Spiræa, with leaves more or less variegated, which bears flat clusters of pale purple flowers later in the season. We have also *S. Prunifolia* in spring, which produces clusters of little white daisy-like flowers, and is very attractive and pretty ; this, however, is not so hardy. The *S. Callosa* and the golden form of the *Spiræa opulifolia*—the cranberry-leafed Spiræa—are good forms with us, especially the latter. Among our sample hedges, of which there are more than thirty under trial, this sends out such a profusion of golden foliage that the bright color can be seen for a long distance. As a single bush it is very fine, too. We have another Spiræa known as the willow-leafed spirea, *S. Salicifolia*, and one also known as *S. tomentosa*, or the hairy spiræa. These are among the more distinct forms of Spiræa that carry you through the season, beginning with the plum-leafed spiræa, which is the earliest, and following with the others in succession, you have spiræas in bloom during a period covering two months in all. The lilacs must have a word said in their favor. The old fashioned lilac has been improved so much in late years by careful selections of the plants and by the cross fertilizing which has been carried on in Europe by different experts, that we have now quite a large list of valuable varieties covering all shades of color, from white to deep purple.

Dr. BEADLE : And double, too.

Prof. SAUNDERS : Yes, double also. The Princess Alexandra is probably one of the best of the new white forms. It is very desirable, and should be better known. Charles X., we find in our experience at Ottawa, to be one of the most prolific in flowers. Indeed, the bushes, which are comparatively small, are very often half covered with flowers in the blooming season. *S. Josikæa* is a very distinct form of lilac, different in character from the old ones, with a very glossy, laurel-like leaf, and purple flowers, which are several weeks later than the ordinary lilac. The forms of the Persian lilac—the white and the purple—are both more or less tender with us, sometimes killing back considerably ; but they usually give us a tolerably good quantity of flowers notwithstanding. There are two or three of the Viburnums which are exceedingly good : *V. Lantana*, which has large and handsome foliage, and large bunches of flowers, succeeded by scarlet berries, which turn almost black later, and are quite conspicuous. The last group of shrubs I shall refer to is the Wigelias. These are not entirely hardy at Ottawa They usually kill down about half their length--some times only a quarter ; but, by judicious pruning, good flowers are produced in abundance, and the shrubs are very handsome. I will call your attention now to the remainder of those I have here : *Corchorus Japonica*, *Caragana Pendula* (Siberian Pea), *Cytisus Laburnum*, *Exochorda Grandiflora*, *Genista Siberica*, *Philadelphus Speciosissimus*, *Rhododendron Vaseyum*, *Rosa Spinosissima*, *Rosa Cinnamonea*, *var. Siberica*, *Viburnum Opulus*, *Weigela Amabilis Rosea*, *Weigela Sieboldii Variegata*, etc. I have not said anything about roses--the cultivated forms—as these would occupy an evening by themselves to discuss.

I have now brought under your notice some of the choicest forms of hardy trees and shrubs, enough, I trust, to afford material for satisfying the most fastidious taste, and enough also to furnish material suitable for all conditions as to space, and which, with judicious selection, may be made to furnish a succession of bloom throughout the growing season.

Dr. BEADLE : Do you find the *Daphne Mezereum* hardy ?

Prof. SAUNDERS : Not entirely hardy.

Mr. WHITE (Ottawa) : We have two or three plants of it that have grown wild and flowered every year for the last ten years.

Prof. SAUNDERS : These things usually gain in hardiness as they endure the climate for a time. We usually find a shrub that is moderately tender to begin with, that will develop a hardiness of constitution that will enable it to stand what would have killed it at the outset.

Dr. BEADLE : In regard to the walnut, Mr. Joly, formerly Premier of Quebec, has a large black walnut grove down in Quebec, still further north.

Prof. SAUNDERS: Yes, he exhibited some of the timber at Chicago this year.

Mr. WHITE: I had one of the first cases of walnut tree fruiting this summer. I am sorry to say the boys stole the nuts; they were a novelty. Very few people have any idea how beautiful the spiked maple is. The trees are very handsome.

The PRESIDENT: Where can they be procured?

Mr. WHITE: They grow wild in the woods.

Prof. SAUNDERS: The Ginala I should have mentioned when I was on my feet. It is hardy from the Atlantic out north to the Pacific. We have grown it on the Indian Head farm for several years.

Mr. SMITH: Have you ever had any Japanese maples?

Prof. SAUNDERS: Yes, we have tried them. I tried a number of different forms in London when I lived there, but they all killed out. We have them in Ottawa, but we keep them in the greenhouse or in the cold cellar in the winter time.

Mr. SMITH: I saw them in Rochester, and Mr. Barry told me that for the first two or three years they had to protect them, but afterwards they could stand the climate.

Prof. SAUNDERS: They would there, but they would not stand our climate.

Mr. CASTON: What about the Catalpa that was issued by the Association a few years ago?

Prof. SAUNDERS: We have three varieties of Catalpa: Speciosa, Tees' Hybrid, and Kempferi. We have trees bearing seed this year in abundance, and anybody can have two or three pods by dropping me a card at any time, as we have collected quite a quantity of them. I think the Speciosa is the hardiest of the three forms, although the Tees' Hybrid, taking it all in all, is quite as hardy. We have trees that have been out four years that have not killed back to any extent; and we find an occasional tree in this forest-planted group that does not kill back, while all the neighboring trees are killed down to the snow line. It may all depend on where the seed was grown that produced that particular tree; but we are not able to trace that back, because we bought the trees from nurserymen and don't know anything about where the trees were grown.

Mr. TURNER: We have a black walnut fruiting in Cornwal that is subject to a large black caterpillar. I would like to know the remedy.

Prof. SAUNDERS: The remedy for all these caterpillars is very simple if you have a spraying apparatus or a pump to spray them with the Paris green and water. That is a species of *Detana* that you refer to—produces a very handsome moth. We have them at Ottawa, and if we didn't look after them once in a while we should find the trees all defoliated, because they eat the foliage very fast; but by spraying with Paris green you can kill them in a very few hours—the whole of them.

Mr. TURNER: Can you grow *Catalpa Speciosa* in Ottawa?

Prof. SAUNDERS: Yes; six or seven years ago I put out a row of trees, and to-day there are about two standing, while the rest are killed out. Another tree has blossomed for the last two or three years very freely.

Mr. CASTON: It makes a rapid growth in our section, but kills back in the winter.

Prof. CRAIG: I would like to call attention to a very important fact in this ornamental shrub matter. I have a great many letters during the year asking where the many varieties of these shrubs can be procured. A number of those that have been enquired about have been already mentioned here this evening, and I am at a loss frequently to know just where to direct the parties, because I have not found, in many of the catalogues of our Canadian nurserymen, lists of other than the very commonest shrubs that have been mentioned. Now, I think that a more general interest in their propagation should be taken by Canadian nurserymen, and that Canadian planters should not be obliged to send to the United States for these desirable ornaments. A very easy method of propagating, that we have practised at the farm, is by taking hardwood cuttings after the growth is ripe in the fall, and setting out just as currant cuttings are set, in a

trench that you may make with a spade in the ground. All that you have to do is to protect them with a little straw or mulch material. The next spring the straw is taken off, and perhaps 40 to 60 per cent. of these will grow—Sibirica, Weigela, Corchorus, Syringa (or Mock Orange), the Deutzias, and Jersey Tea—in fact most of the desirable varieties which are mentioned can be easily and readily grown in this way. Another shrub, and the most valuable probably, mentioned this evening—the Hydrangea—is most profitably produced from green wood cuttings, just as you slip a geranium, and can be set in a cold frame or in a box set in a shady place, the cutting being three or four inches in length, with the two lower leaves taken off and inserted down to the two upper leaves; you will find it will root very quickly in this manner.

Mr. CASTON: There is a shrub growing wild north of Lake Superior. You come across it at Port Arthur, among the rocks. It is very much like the Snow-berry in habit, grows about the same size—five or six feet high—and it is useful as well as ornamental, for it produces a very rich fruit—the plant is bent over with the weight of the fruit.

Prof. SAUNDERS: There is no doubt it is one of the dwarf forms of the June Berry.

Mr. CASTON: But it was along about the 11th or 12th of July.

Prof. SAUNDERS: You would not expect it in June in your country? It belongs to the same family as the Saskatoon Berry of the North-West.

STANDING COMMITTEE ON NEW FRUITS.

The SECRETARY: I think it would be well to appoint a committee in the line of Mr. Beall's paper, whose names would be published as a committee on new fruits, to whom any new fruits during the year might be sent for their opinion, and that this committee should be expected to report to us, through the chairman, at the next meeting. I would move that the Committee be A. McD. Allan, D. W. Beadle and John Craig.

Mr. BEALL: That Committee, I think, should also revise all present lists.

The SECRETARY: Yes, I think that should be among their duties.

Mr. EDWARDS seconded the motion, which was carried.

VOTES OF THANKS.

Mr. MCNEILL: I take great pleasure in moving that the thanks of this Association be tendered to the Mayor and Corporation of Peterborough for their kindness in granting us accommodation and entertainment, and that the Secretary present this resolution to the proper parties.

Mr. M. PETTIT seconded the motion, which was carried.

Mr. BOULTER moved a vote of thanks to the press. Mr. CASTON seconded.

The PRESIDENT: We have been more carefully looked after by the papers here than any place I have visited. Both reporters have been constantly with us.

The motion was carried.

The PRESIDENT: I think we are very much indebted as an Association to Mr Edwards.

The SECRETARY: I was going to say that we should express to Mr. Edwards, as President, and to the Peterborough Horticultural Society, our thanks for their kind invitation here and courteous attention to us while we have been here.

Dr. BEADLE: I want to second that motion. I should take up too much time if I began to speak on the subject.

The motion was carried amid applause.

Mr. EDWARDS: I think we who live here should give the Association not only thanks, but some more heartfelt recognition of your kindness in coming here to give us information and to help us in the work we are trying to do. I must say that I look upon it as a great compliment on the part of the Association to come here, and we are the ones who are indebted, and not you.

The PRESIDENT: Now, gentlemen, the work of this Convention for this year is done. We have not had as large an attendance as we would like to have had, but we have got through a great deal of very valuable work, I think. This work will all tell in the long run, because it will appear in the Report, and though it may not have been immediately felt just about here in this locality I think it will be felt in a very much wider field than this. Nothing more being before the chair, I will declare this annual meeting closed.

The Convention adjourned at 12.30.

APPENDIX I.

INSECTS INJURIOUS TO PLANTS.

CONTRIBUTED BY THE SECRETARY.

The title of this paper, as I first wrote it down, was misleading. It was "Insects Injurious to the Fruit-Grower." A lady seeing it remarked, "Your subject seems to be rather a limited one; with how many insects is the fruit-grower affected?"

In a way, surely the fruit-grower is affected by all those insects which injure his fruit—his pockets certainly suffer to an immeasurable extent. It has been computed that hundreds of thousands of dollars are annually lost to our fruit-growers, through the injuries caused by our insect enemies.

I am well aware that in treating upon insects I am treading upon well-worn ground, and I can scarcely be expected to bring before you any new discoveries. The pathways are well worn by such masters of entomology as Riley, Packard, Saunders, Harris, Ormerod, Pettit, and numerous others. Mr. Packard's work is too general for the use of the fruit-grower; Harris' is most interesting, but not arranged well enough, nor is it sufficiently complete to meet the needs of the practical fruit-grower; Riley's work for the United States, and Miss Ormerod's for England are invaluable, but it remained for our own Professor Saunders to write a book, under the title of the above heading, exactly suited to the needs of Canadian fruit-growers, arranging it for practical purposes under such heads as "insects injurious to the apple," "to the pear," "to the peach," "to the grape," etc., classifying the different insects under each head according to the part which they affect, whether the root, bark, leaves or fruit. This has proved a most convenient arrangement. I would suggest to some of our amateur collectors that they might make for themselves a most interesting collection on this same basis. This would not be so scientific an arrangement from an entomological point of view, but it would be be exactly right in the eyes of the professional horticulturist.

It would obviously be absurd for me to attempt to cover in a paper like this even a general survey of the ground so well gone over by Professor Saunders; I shall only attempt to give you some idea of the more well known injurious insects which just now are great obstacles in the way of success in making the garden and orchard profitable throughout the fair Province of Ontario.

THE CODLING MOTH AND THE CURCULIO.

At the very head of our enemies in the insect-world is the Codling-Moth, (*Carpocapsa pomonella*). Like other insects, it is increasing with the increasing supply of apples for it to feed upon, until of late years it has threatened the total destruction of our apple crops. A few years ago, before the practice of spraying with arsenites came into use, the pest became so serious that one third of the crop had to be thrown out as seconds, purely on account of its ravages. If these insects were content to feed upon the poorest of the fruit we would not grumble, as they would do us a good turn by thinning out our fruit, but, unfortunately, they choose the fairest and best, thus directly robbing us of our hard-earned profits.

Many and very ingenious devices have been tried to keep these insects under control, as, for instance, trapping the moths with bottles of sweetened water; by twisting hay bands about the trunks of the trees, into which the larvæ would crawl to pupate, and then wringing these bands through a wringer to destroy the cocoons; by keeping sheep and pigs in the orchard to eat the infested fruit, worms and all, as it falls to the ground, but every one of these devices has served only to check, not rid us of the evil.

Can the fruit-growers be blamed then because, when the use of arsenites sprayed on the trees and fruit was found to be a success, they adopted it almost universally? I speak of this because objection has been made on scientific grounds to the use of arsenites, since by the use of them not only the injurious, but also the useful insects are often destroyed, and, among the latter, many parasites whose friendly office might in the end keep these enemies in check without the expense and trouble of applying poisons. The true principle, they say, is to favor the increase of these parasites and introduce other insect friends and thus cope with our foes in a manner which can be approved of on scientific grounds.

Possibly such a course would be the wiser one in the end, but "a bird in the hand is worth two in the bush," and I fear the fruit-growers have no patience to sacrifice a present advantage for an ulterior good.

There are two broods of this moth,—the first is on the wing about the time of the opening of the apple blossoms, when each female deposits her tiny eggs singly in the calyx-end of the apple; and, as each moth deposits on an average about fifty eggs, it is easy to see how rapidly the insect may increase. There is a second brood of the moth in the latter part of July, but, if the first brood is destroyed, the second will be, of cource, destroyed with it. Hence arsenites, applied once or twice in June, will ensure a fairly sound crop of fruit.

Year by year less poison in dilution is found to be sufficient to accomplish the purpose. One pound of Paris green to 200 gallons of water is the usual prescription, but many experimenters have found that 250 gallons will not form too dilute a mixture.

Formerly it has been necessary to depend upon American inventors for tools for this work, but there are one or two spraying pumps invented in Canada which now answer our purpose well.

How best to cope with the curculio has long been a problem. Not only are the plum, apricot and peach stung and caused to drop by means of its evil doings, but the apple and pear are also subject to its ravages, and as a result, are much knotted and ill-formed. On this account the apricot is little grown in Southern Ontario where it might, otherwise, succeed well, and many fruit-growers are even debarred from engaging in the cultivation of plums.

Until spraying with Paris green was introduced, jarring of the trees was the only method adopted and, where faithfully performed, has been, on the whole, successful; some experimenters claim that it is more effective than the use of Paris green. The operator jars the tree with a sharp tap of a mallet and the "little turks" are gathered up in a sheet and burned. This must be continued every day until the plums are well grown. It is a much simpler plan to give the orchard one or two good sprayings, which will suffice, unless constant rains wash off the poisons, providing always that the first application is made almost as soon as the foliage appears, in order to destroy the parent beetles. The preferable method is scarcely yet settled. Professor Green, of the Ohio Experiment Station, strongly advocates the spraying method as most effective, while Professor Beal, of the Michigan Station, favors jarring.

The Curculionidæ is a numerous family and nearly all are harmful. Mr. Billups, who read a paper at one of our meetings at Niagara, stated that the members of this family number nearly ten thousand species, many of which are injurious to our fruit.

The Oyster Shell Bark Louse.

This is one of the worst pests of our Canadian apple orchards because it works almost entirely unseen by ordinary observers on account of its small size. Some of our worst foes are so minute that their presence can be only discerned by the use of a microscope. In its first stages this louse is almost microscopic. The eggs, which lie all winter concealed under the dead body of the parent louse, hatch out into tiny lice which emerge from their covering during the warm days of the early part of June, and in about a week they settle down upon some smooth place on the limbs, often concealed from view by patches of old bark. There they spend the summer sucking the juices of the tree, weakening its vigor, until full grown when each becomes a scale, covering in its turn

three or four score of eggs. When I first discovered it in my orchard, I found many trees almost dead through its effects. The bark was rough, but I had not previously suspected that these rough places were scales concealing young lice. Lousy trees! What a disgrace! I soon set to work with alkaline solution, such as washing soda and potash, and also with kerosene emulsion, and by their use have succeeded pretty well in destroying them. If neglected, these insects will in time completely cover a tree, even to the outer branches, and it is difficult then to reach them with broom or scrubbing brush. The only plan left is to spray the whole tree with an alkaline solution and kerosene emulsion. Some of the formulas recommended are as follows:

Kerosene Emulsion: Common or whale oil soap one half of a pound; one gallon of hot water, and two gallons of kerosene. Stir until all are permanently mixed, and then before using dilute with nine parts of water. This will be found one of the most effective remedies for the Oyster-Shell Bark Louse Another more simple remedy and yet, if faithfully applied, quite effective, is a soda wash made by dissolving one-half a pound of common washing soda in a pail of water. Alkaline wash may be made of common lye and water, which, if applied during the first week of June when the young insects are first hatched out and are in their most tender stage, will, in most cases, answer every purpose. If concentrated lye is used a pound should be diluted in a barrel of water.

Among the newer enemies which the fruit-growers have to meet are the Pear Tree Psylla and the Raspberry Gall Fly, and of these we give a brief notice.

Pear Tree Psylla.

The Pear Tree Psylla bids fair to become one of the most troublesome enemies in fruit-growing which has yet appeared. As if it were not enough to discourage pear growers that the blight so often destroys their finest trees and the Curculio and Scab ruin their finest fruit, this tiny insect must appear, having emigrated from Europe, and completely wreck their bright hopes of success. Only so recently as 1891 was this insect noticed as a formidable enemy, and pear growers in various parts of the Eastern States lost thousands of dollars' worth of fruit and many valuable trees through its ravages.

A very excellent bulletin by Professor Slingerland, of the Cornell Experiment Station, devoted to this insect, has been published, from which we gather much of the accompanying information, in advance of its ravages; for there is little doubt that Canadian pear orchards will be visited by it during the coming spring.

Already New York State has suffered severely. Mr. H. Wright's orchard, near Ithaca, N.Y., promised in 1891, 600 bushels of fruit, but less than fifty bushels matured, and but a few trees made any growth. Mr. G. T. Powell, of Ghent, N.Y., a prominent fruit grower, stated that the insects reduced his pear crop that year from an estimated yield of 1,200 barrels to an actual yield of less than 100 barrels of marketable fruit. Besides this the trees in the orchard had a stunted appearance, no doubt owing to the attacks of this pest.

The Pear Tree Psylla was first introduced into this country from Europe in 1832, by Dr. Plumb, of Salisbury, Conn. The year after he first noticed it, and during the next five years, he lost several hundred trees by its ravages. From various reports it appears that the pest has already reached the Mississippi Valley it its progress. The severe outbreak of 1891 proves that in New York State, at least, it has become so numerous that it only requires favorable opportunity to do an exceedingly great amount of damage.

Entomologists class the Psylla as belonging to the family Psyllidæ, or Jumping Plant Lice, under the sub-order Homoptera. The general name Psylla is derived from the Greek word meaning a Flea. In Europe there are three species which infest the pear tree, and our species, Pyricola, is not the worst. Let us hope therefore, that its relatives may never reach us.

Among the indications of its presence are the following :

The old trees will be observed to make little new growth ; new shoots droop and wither in May as if from loss of sap. A little later the old trees put on a sickly appearance ; the leaves will turn yellow, and the fruit grow but little, and about midsummer most of the leaves and half formed fruit will fall from the trees. Besides this the insect secretes a large amount of honey dew which covers the twigs, trunks and branches of the trees after the leaves expand, as is found throughout the season. At first this substance is clear like water, but soon assumes a disgusting blackish appearance, owing to the fungus growth within it.

Mr. Slingerland visited Mr. Wright's orchard at Ithaca, in the latter part of November, 1891, and states that the whole orchard appears as if a fire had swept quickly through it, scorching trees and blackening trunks, large branches and the smallest twigs. The Bartlett and Duchess varieties suffered the most.

The insect may be perhaps recognized from the following points of description, together with the accompanying illustrations :

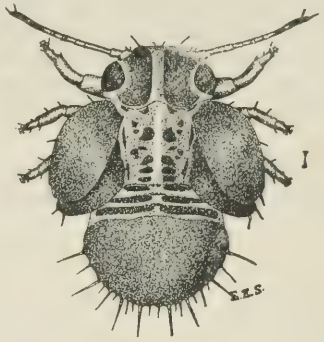


Fig. 1.

Fig. 2.

Fig. 1 represents the nymph or immature forms when first hatched. They are translucent yellow in color, and hardly visible to the naked eye, eighty of them placed end to end would scarcely measure an inch, but they increase in size until about twenty of them would measure an inch. A very conspicious feature is a broad black wing pad on each side of the body. Fig. 2 shows the adult insect, which strikingly resembles the Cicada in minature; it would take nine or ten of these placed end to end to measure an inch, and the air line in each case by the side of the insect shows the natural size. The general color is crimson, with broad black bands across the abdomen. The legs have thickened femurs to aid the insect in leaping.

Mr. Slingerland found, when examining Mr. Wright's orchards in winter, hibernating broods of adults. They were hidden in crevices of large trees ; a favorite hiding-place on some trees was in the cavity of the bark about the scar of the severed limb. By April, 1892, the larger part of the eggs had been deposited singly. These had been placed in the creases of the bark, or in old leaf scars, about the bases of the terminal buds of the preceeding year's growth. The eggs are small and shining, and of a light orange yellow color. A short stalk on the larger end attaches the egg to the bark, and a long, thread-like process projects from the other end. By the 18th of May the most of these eggs are hatched out, and the minute nymph immediately seeks a suitable feeding place, where it sucks the sap with its short beak, a favorite place being in the axils of the leaf petioles and stems of the forming fruit. In about a month they are adults. The adult has strong legs and wings, and thus is able to move readily to distant orchards.

To be forewarned is to be forearmed, and therefore, the importance of making public at this time the methods of combating this pest, as laid down in Mr. Slingerland's bulletin, is evident.

None of the fluids applied seem to be destructive to the eggs, but the nymphs are found to be easily destroyed by kerosene emulsion. The emulsion was prepared after the following formula : One-half pound of hard or soft soap, one gallon of water and two gallons of kerosene. This was then diluted with twenty-five parts water, and in every case the nymphs were destroyed almost immediately after coming into contact with the liquid. The best time to spray for this nymph is early in spring, just after the leaves have expanded, probably, as a general rule, the two weeks succeeding the 15th of May. If this is faithfully done, the pest will be completely checked for the season.

Raspberry Gall Fly.

This is by no means so formidable an enemy as the last, but it is one almost unnoticed in Ontario until last year, when Dr. Brodie, of Toronto, who has been making a specialty of the study of Canadian galls and gall flies, wrote an article for the *Canadian Horticulturist* describing this fly. He tells us that it has been plentiful for the last twenty or thirty years in the county of York, on both cultivated and wild varieties of raspberries. The only reason why this insect does not completely destroy our raspberry plantations is the fact of its being kept in check by parasites, and, in Dr. Brodie's opinion, the encouragement of these is, in almost all cases, the true way of keeping in check the harmful creatures.

The illustrations which follow were drawn from life by Miss Violet Brodie, the doctor's daughter. Fig. 3 represents one of the galls as it appears on the raspberry bushes. There are over two inches long and three-quarters of an inch in diameter, covered with short prickles and of the same color as the bark of the cane. If these are collected the second season and put in a bottle the gall flies will emerge about the middle of May and may be seen walking on the

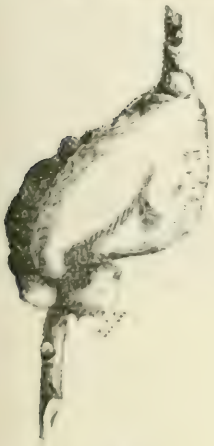


Fig. 3.

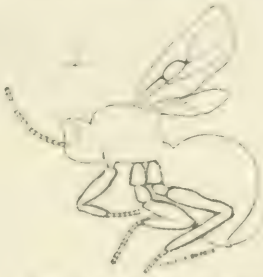


Fig. 4.—The Gall Producer. (*Diastrophus Turgidus.*

Fig. 5. Parasite of the Gall Fly.

side of the jar next the light. Fig. 4 represents the insect under consideration, which is known to entomologists as *Diastrophus Turgidus*. The doctor describes them as short and chunky, the head and thorax black and the abdomen reddish brown, flattened laterally and rounded.

The most numerous parasite, he says, is Torymus, which is of a coppery, brown-greenish color, wito a long ovipositor. Fig. 5.

The next most numerous parasite is the *Ichneumon*, Fig. 6, with head and thorax black, and abdomen reddish, blackish toward the end.

Another parasite is the *Ormyrus*, Fig. 7, which is uniform black color, the thorax punctured and rough, and the abdomen smooth, shining and pointed.

Fig. 6.—Ichneumon Fly, Parasite of the Gall Fly.

Fig. 7. A Species of Ormyrus.

These parasites should be encouraged and by no means destroyed, and by their aid this insect will be probably so kept in check as never to become a formidable enemy to the fruit grower.

In connection with this Raspberry Gall, we may notice another Gall not often described in public print. It is the Pithy Gall of the Blackberry, and the producer is a near relative of the Gall Fly. It is known as *Diastrophus nebulosus*

Fig. 8 shows one of the Galls which it produces on the blackberry canes. If these are cut open transversely, they will be found to contain a number of oblong cells, each about one-eighth of an inch long and containing a single larva. The perfect insect appears in spring and is about half an inch long, black, with transparent wings, and red feet and antennæ. The parasite insects prey upon this, as well as upon the Raspberry Gall Fly. A sample of this was sent us by a correspondent.

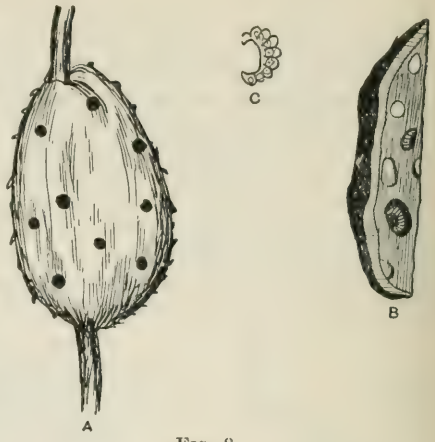


FIG. 8.

Time and space would certainly fail us were we to enumerate a full list of the fruit-grower's insect enemies; the stem and leaf of the grape vine, of the apple tree, and a long list of small fruit plants are all subject to the ravages of numerous destructive insect foes, some of which are easily dealt with, and others so difficult that to overcome them is still a difficult problem in our road to success

In view of all this, we feel the necessity of appealing to our professional friends, who are students of science, to aid us in solving our problems. Already we, practical men, are much indebted to scientists for the practical turn which they have given their investigations, and we venture to hope that, in the near future, they will place us under still deeper obligations along the line here indicated.

THE GRAVENSTEIN APPLE.

Mr. R. W. Starr, of Starr's Point, Nova Scotia, one of the best Canadian authorities on apples, writes to our Secretary as follows, concerning the Gravenstein apple:

For many years past this apple has been placed at the head of the list as a standard, profitable variety, by which all other sorts are compared for their commercial value to the orchardist. And so far it still retains its position, and has no successful competitor during its season, it is fast driving every other fall apple out of cultivation, for the reason that it can be more profitably grown than any other variety, and when placed on the market will always outsell any other sort of the same season.

From its thrifty, vigorous habit of growth, and well known reputation for early bearing, it is a favorite for working over old and unprofitable varieties, and seems to have the power to adapt itself to all varieties of stock and most conditions of soil.

As to its longevity, we have fruited it for between 50 and 60 years, top grafted on full grown trees that are bearing good crops yet, nor do I know of any Gravenstein trees on good soil dying of old age. We sometimes lose them as we lose other sorts by borer, collar rot, or sap-blight, but not more in proportion than other sorts, and when this does occur it may generally be traced to injudicious cultivation, want of drainage, or some climatic influence that is beyond our control.

As a shipper it will stand the voyage across the Atlantic and come out in good order if properly handled before shipment, and carried in well ventilated between-deck compartments. The tough, unctuous, close-grained skin makes it a good shipper, and I have no doubt but that the season for marketing might be prolonged for several weeks by placing the fruit in cool storage as soon as taken from the tree so as to retard its ripening. At present the shipping season to London is limited to say from September 15th to October 10th but for home markets they are frequently held into December, and it is not an unfrequent occurrence to see a barrel opened in March, showing perfectly sound.

In looking over some old papers I find a list of described varieties that I had written out in 1861 to accompany a collection of fifty varieties of apples grown on the old Starr homestead and sent to the London Horticultural Society's Show, held in conjunction with the World's Fair in the Crystal Palace of that year. The Gravenstein finished the list, and as this description and history was written so long ago, and the added experience of thirty-two years of close observance, has if possible increased my opinion of its value, I have copied it verbatim, to show that this apple is no new craze, but that it has steadily won its way to the top of the front rank and holds its position by genuine merit.

"This fine apple is said to have been originated at Gravenstein in Holstein. It was first introduced to Nova Scotia about the year 1835 by the late Hon. Charles R. Prescott who procured scions from the London Horticultural Society (of which he was a member) and grafted on bearing trees in his orchard at Starr's Point. Those branches bore fruit in '38 and from that source has originated all the Gravenstein trees of the Province. The tree is of strong, quick growth, and bears young. It is very productive, and perfectly hardy in this valley. Fruit large, varying from oblate to roundish, frequently irregular, and sometimes ribbed, stalk short, thick, and deeply set in a narrow cavity. Calyx large, closed, set in an irregular and rather wide basin; skin smooth, tough, bright yellow, at maturity; splashed, shaded, and marbled, with dark and light red, tinged with orange. Flesh quite firm, crisp, very juicy, with a brisk vinous slightly aromatic flavor, and in ripening develops a great deal of fragrance. Commences to ripen from 10th to 15th of September, but is not usually fully grown and colored before the 25th and if stored in a cool cellar may be kept until midwinter, i.e., *if kept under lock and key.*"

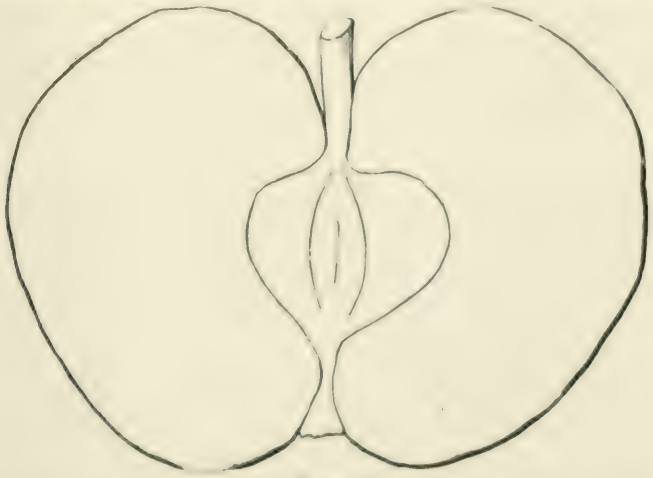
Starr's Point, September, 1861.

REPORT OF COMMITTEE ON NEW FRUITS—SEEDLING APPLES.

Mr. John Craig, chairman Committee on New Fruits, handed in the following Report:

A large number of samples of apples, mainly seedling varieties, have been received during the past year. The two following seem to merit propagation and a careful trial:

DERY, Syns.: (*Alexis Baldwin. Dery's Seedling. Pomme de fer.*).—Received from J. L. Dery, of Mont St. Hilaire, Quebec, October 7th, 1891. The original tree examined October 23rd, 1892, and further samples received from Mr. Dery this autumn. Mr.



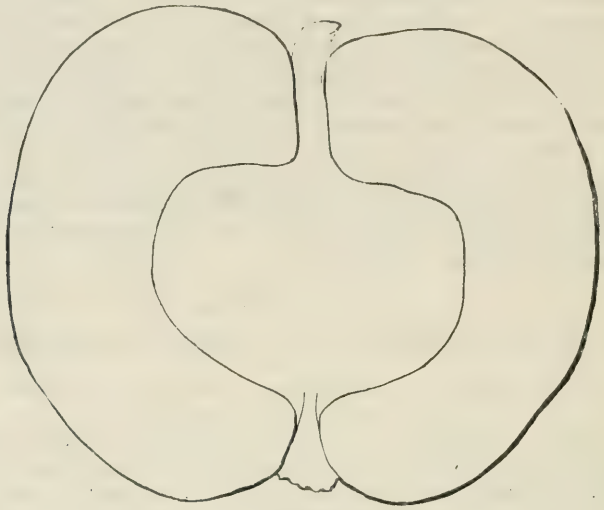
DERY.

Dery says this tree was raised from seed of American Baldwin, planted by his father about seventy years ago. Since fruiting age it has borne moderate annual crops. It is fairly healthy, and with good care should live for many years.

Fruit large, oblate, 3¼ by 2½ inches. Slightly ribbed. Skin green, and almost entirely covered with red, which is specked with numerous white dots, resembling Canada Baldwin closely in this respect. Stem short, usually about half an inch. Cavity moderately shallow, regular and slightly russetted. Basin small, wrinkled. Flesh greenish white, firm, lacking juiciness, sub acid ; quality good. The best condition during March and April.

The apple known and cultivated in the eastern townships as "Pomme de fer" resembles the above closely, and is evidently from the same stock.

CALUMET: Received from Mr. W. H. Murphy, Ottawa, who describes the tree as growing on his farm on Calumet Island, supposed to be of seedling origin, apparently about thirty years of age.

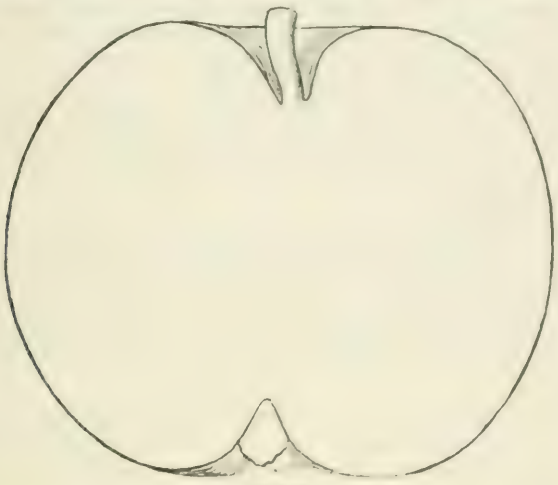


CALUMET.

Fruit medium to large, round, when fully ripe, yellow, partly covered with streaks and splashes of light red. Stem short. Cavity almost wanting. Calyx open; basin small and shallow. Flesh firm, white, very juicy, sub-acid, good. Mr. Murphy says it keeps through the winter with ordinary care. Specimens kept in my office were in good eating condition on the first of last June. The skin of this variety is not of the kind that "spots" readily.

BANKS' RED GRAVENSTEIN : The large number of variegated plants now in cultivation have all appeared, at different times, as single shoots upon the parent tree, and their peculiarities are reproduced and multiplied by means of bud propagation. A striking example in pomological lines of this force or power was recently noted in the collection of apples exhibited at Chicago by the Province of Nova Scotia. Among them was a variety called the "Bank's Red Gravenstein," which the introducer, Mr. A. S. Banks, Waterville, N.S., claims, "appeared as a sport upon the common Gravenstein tree in the orchard owned by E. C. Banks, Waterville, and that this branch has for thirteen years always borne apples that were almost wholly red." In appearance it is rather rounder and possibly less ribbed than the average Gravenstein ; not quite as large, with a much more brilliant color, many specimens being entirely covered with deep crimson. In quality there is little difference from the type. In season it is said to be two to four weeks later. Its brilliant color and greater keeping qualities should add much to its value. The following is a description made from a typical specimen taken from the tables at Chicago, and the cut illustrates the same specimen :

Medium size, round, regular; calyx closed; basin shallow, obscurely ribbed. Stem $\frac{1}{2}$ to $\frac{3}{4}$ of an inch long, set in deep narrow cavity. Color deep yellow, almost covered with splashes and blotches of brilliant crimson. Flesh white, moderately firm, juicy, rich, subacid, melting. Quality best. Core open. Same type of flesh and juice as Gravenstein.



Banks.

As a sport from the old time favorite it is exceedingly interesting, and as a possible competitor it should receive careful attention.

NEW FRUITS AT THE CENTRAL EXPERIMENTAL FARM IN 1893.

Mr. Craig further supplemented his Report by the following:

Grapes.

The following varieties fruited this season:

Alexander's Winter: Received in the spring of 1891, from S. D. Alexander, Bellfontaine, Ohio. Sent out as a white winter variety. Vine a fair grower, with foliage characteristic of the Labrusca type. Bunch loose, straggling; berry large, round and very slightly oval; very dark amber in color; skin thick, fairly tender, very little juice; pulp meaty, acid; seeds large; quality only fair; ripens with Salem. Not likely to be valuable.

Brilliant: Mr. T. V. Munson, Denison, Texas, produced this variety by pollinating Lindley with Delaware in 1883. The vine is moderately vigorous, bunch long; shouldered; berry medium size, almost round; color deep garnet; skin thin, juicy; pulp tender; seeds large, usually 2 to 3; quality good; berries do not drop easily. The first fruit of this variety did not ripen this season, although claimed to be as early as Delaware by the introducer.

Chase Bros.: A single vine of a variety received from Chase Bros. & Co., Rochester, N.Y., in 1887, and entered in the vineyard records under the above name, has fruited for the past three seasons. The introducer writes that "the variety originated with Jacob Moore, formerly of Brighton, N.Y." They further say "that the fruit is most excellent in quality, but it proved to be a shy bearer here, so much so that we did not feel justified in putting it on the market." As fruited here the bunch is of medium size; shouldered, fairly compact; berry medium size, round; color rich bright wine; skin fairly thin, juicy, very sweet; pulp tender, melting; seeds medium size, usually two; quality

good; ripens with Delaware; berries drop somewhat after picking. While recommending this variety to the growers, I would have them bear in mind the experience of the New York introducers.

Eclipse: Originated with John Burr, of Leavenworth, Kansas, and introduced by Stayman & Black, nurserymen, of the same place. Vine a weak grower; bunch medium to small; shouldered; berry large, round; vivid green in color; skin fairly thick; small amount of juice; pulp tender, brisk acid; fair quality; berries hold on well; ripens a week later than Concord. Too late for this locality.

Farrell: Origin the same as the last. Vine a moderate grower; bunch large, tapering; shouldered; berry medium to small, round, yellowish white; skin thin; pulp rather tough; juice vinous sweet; seeds small, numerous. Too late for this locality, taking this season as a criterion.

Hermann Jæger: Originator, T V. Munson, Denison, Texas. Produced by pollinating Vitias Lincecumi—the Post Oak grape of Texas—with Herbemont, an old Texas variety. This did not fruit in a sufficient quantity to give a correct impression of the size and form of the bunch, which is said to be large and shouldered. Berry small, round, black, with purplish bloom; firmly attached to peduncle; juice and pulp sprightly acid; seeds small; not ripe when picked, October 10th. Later than Concord. Not promising for this vicinity.

Ideal: A seedling produced by John Burr, and introduced by Stayman & Black, of Leavenworth, Kansas. Bunch medium size; berry large, round, purplish amber; skin thick, juicy, vinous sweet; pulp tender; seeds large and numerous; quality fair to good. Ripens with Concord.

Oneida: Said to be a seedling of Merrimack, which it does not resemble in a single characteristic. Vine a short-jointed, weak grower; bunch medium size, slightly shouldered; berry small, oval, amber-colored; skin thick, tough; juice rich and sweet; pulp meaty and acid; seeds large. This variety keeps well, which seems to be its only point of merit.

Paragon: A seedling produced by John Burr, and introduced by Stayman & Black. Bunch medium size, cylindrical, compact; berry medium size, round, black, with purplish bloom; skin thin; very juicy, with a tender, dissolving pulp; seeds small; quality medium; berry does not drop readily; ripe September 5th; keeps till December. Berries resemble Early Victor quite closely.

Standard: Origin the same as the last. Bunch and berry medium; black; skin thin; small amount of juice; pulp tough and acid; ripens a little in advance of Concord; loses flavor rapidly. Not promising.

Campbell: Produced from seed of Triumph by T. V. Munson, Denison, Texas. The first fruit of this variety has given a small compact bunch; berry medium to small, round; skin thin, translucent; very juicy; pulp melting; seeds small; quality good. Ripens with Concord.

White Beauty: A seedling produced by John Burr, and introduced by Stayman & Black, Leavenworth, Kansas. Bunch medium size, compact; shouldered; berry round, clear white, covered with light lilac bloom; skin thin; very juicy; pulp moderately tender; seeds numerous; quite foxy; medium quality; late.

Black Raspberries.

Older: This variety originated with and has been introduced by R. D. McGeehon, Atlantic City, Iowa. It was set out in the spring of 1892, bearing some fruit the same season, and an abundant crop this year. The plant is exceedingly vigorous, and roots from the tips readily. Berry large, round, deep black, with very large drupes. The seeds are not prominent, and the berries are borne in good-sized clusters. It also has the habit of fruiting heavily on young wood. This year the first fruit ripened with Hillborn, while it continued bearing till the season of Gregg had closed. So far it seems to be a profitable variety.

A number of the newer black caps are being tested, but the above is the only one which so far stands out prominently as a variety worthy of careful trial.

Seedling Raspberries.

The seedling raspberries so favorably mentioned by a joint committee of the fruit-growers of Ontario and Quebec, in the Annual Report for 1890, have been undergoing further trial by being transplanted and subjected to ordinary field culture. Some have not sustained their early reputation, while others at first not deemed promising have done remarkably well. One variety not mentioned by the committee in this report, for the season being very late it was not at its best at the time of their visit, has since shown so many points of excellence that it has been named and is now being propagated for distribution. It may be described as follows:

Sarah: (Record number ⁂.) Produced in London, Ont., by Prof. Saunders, from seed of Shaffer's Colossal. Plant a moderate grower, suckering freely, and propagating naturally only in this way. The foliage seems to be intermediate between the European raspberry *Rubus Idaeus* and the American *Rubus Strigosus*. The canes have been affected to some extent by anthracnose, but not more than Cuthbert or Marlborough growing alongside. Fruit large, round, drupes large, deep garnet, firm; very juicy; pleasantly acid and exceptionally rich. A few ripe berries were found last year, and this at the time of the first picking of Cuthbert, but the main crop did not ripen till the season of Cuthbert was over, the last good picking taking place each year from the 8th to the 12th of August. A striking characteristic of this variety is its habit of ripening the fruit in consecutive order and much regularity, beginning with the terminal clusters of each branch. Of course, this is in a measure true of all red raspberries, but none that I know of carry the peculiarity to the same extent.

CANADA'S HORTICULTURAL EXHIBIT AT THE WORLD'S COLUMBIAN EXHIBITION.

The Secretary's Report.

Having accepted, with the approval of the Directorate of this Association, the position of Superintendent of Canada's Horticultural Exhibits, under the Minister of Agriculture for the Dominion, it is but proper that I should give some account of my work.

I may begin by saying that Canada was the most prominent exhibitor of fruit, unless we except California whose immense orange exhibit was a most wonderful display. No country had her court so tastefully decorated; for over the exhibit on a large arch was the word CANADA in letters twenty-seven inches high so that it could be read a long distance away; and over the exhibit of each separate province smaller arches were made showing the name of the province.

The following tables will faithfully represent to you a comparative view of the number of varieties of fruits and vegetables from the various provinces and experimental farms of the Dominion.

The first table includes both those shown in a fresh state and those in solution. The totals in the right hand column are not the sum of the number of varieties exhibited by the various provinces and experimental farms, for many of the same were shown by each; it contains simply the total number of distinct varieties shown by all, duplicates omitted.

In variety of fruits shown, Canada's exhibit was far in advance of any, owing to the large number exhibited by Ontario. The apples of Ontario, Quebec and Nova Scotia, the plums of British Columbia, and the pears, peaches, cherries and small fruits of Ontario were special objects of admiration. In bottled grapes, the exhibit by Ontario was remarkably good, but that made by the Central Experimental Farm at Ottawa surpassed every other shown at the fair during the early summer. They were remarkably well preserved, even the bloom being plainly discernible through the liquid.

FRUITS OF 1892.

	Ontario.	Quebec.	Nova Scotia.	British Columbia.	Prince Edward Island.	North-west Territory.	Central Experimental Farm, Ottawa.	Exp. Farm at Nappan.	Exp. Farm at Indian Head.	Exp. Farm at Brandon.	*Canada.
Apples	111	140	86	27	27	.....	.....	.....	.....	.....	292
Pears	59	12	13	.....	2	.....	.....	.....	.....	.....	73
Peaches	19	.....	1	.....	.....	....	.....	.....	.....	.....	19
Plums	55	14	17	20	12	.....	13	.....	1	.....	86
Cherries	16	3	10	.....	.....	.....	22	.....	.....	.....	39
Grapes	53	30	10	.....	.....	.....	111	.....	.....	....	139
Strawberries	59	...	.....	.....	4	.....	.....	.....	.....	1	61
Currants	16	3	4	.....	1	8	.....	.....	5	9	25
Gooseberries	19	.....	7	.....	3	.....	13	1	1	1	37
Raspberries	13	.....	1	.....	.....	.....	13	.....	5	3	18
Blackberries	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	4
Total of all kinds	424	202	149	47	49	8	172	1	12	14	793

In strawberries, Ontario was far ahead, and also in Heart and Bigarreau cherries, while in the Morellos the Central Experimental Farm took the lead, owing in part to the many Russian varieties under test.

The Province of Ontario deserves especial notice, because fully one-half the bottled fruit on exhibition from Canada was from Ontario. The Superintendent, Mr. A. H. Pettit, was engaged one year previous to the Exposition in collecting and preserving the fruit, and well earned the direct credit of the success gained by his province. No money was spared by the Provincial Government to make the exhibit a success, and much of the expense of installation and maintenance of Ontario's exhibit, as well as of the beautiful bottles containing the fruit, was furnished by that province.

The British Columbia apples, which had been kept in cold storage during the winter, were immense; and the huge Spys and Pearmains puzzled even the judges over their identity, owing to the peculiar habits of development induced on the Pacific Coast. The quantity was small, however, owing to the majority being frost-touched in transit to Chicago. The same misfortune apparently befell Nova Scotia's apple exhibit, though to a smaller extent; but to this was added careless handling by the cold storage employees, who had been instructed to open all packages and remove the paper wraps. Notwithstanding this, Nova Scotia's apple exhibit in May and June was a very interesting one, especially to the scientific student of horticulture, owing to the number of varieties. In this, however, Nova Scotia was outdone by Quebec, which showed one hundred and forty varieties, by far the largest collection of 1892 apples shown by any exhibitor at the World's Fair. Ontario came next with one hundred and eleven, but two-thirds of them were in bottles; and New York State next with one hundred and two varieties, none in bottles. Even Prince Edward Island showed twenty-seven varieties, some of them quite creditable, especially considering her climatic conditions.

From the next table it is quite evident that the largest part of the exhibits of fresh fruits of 1893 were made by the Province of Ontario. Some idea of her generous display may be gained from the fact that she not only filled her allotted space of two thousand square feet—one-half the whole Canadian Court—but was even compelled to seek additional space to accommodate the surplus during the last month of the Fair.

During the whole summer Ontario, being near at hand, was able to keep up an almost daily supply of small fruits, which could not be done by the other provinces on account of distance. From the time, therefore, of the disastrous cold storage fire until the apples of 1893 were ready, the tables of the other provinces were of necessity rather

* These are not the totals of the figures given, for there are many duplicates.

bare, a lack, however, which was then fully remedied. Indeed, when Mr. Bigelow, representative of Nova Scotia, arrived in the beginning of October, and laid out on the tables two or three barrels of Nova Scotia Gravensteins the Nova Scotia Court became the subject of general admiration. A sport of this famous apple was also shown under the name of Banks Red Gravenstein, smaller in size, but higher in color and better in quality.

FRUITS OF 1893.

	Ontario.	Quebec.	Nova Scotia.	British Columbia.	Prince Edward Island.	Central Experimental Farm, Ottawa.	Exp. Farm at Indian Head.	Exp. Farm at Agassiz.	Canada.
Apples	144	119	144	51	30			22	318
Pears	67	2	23						82
Plums	75		10	17				15	98
Peaches	42								42
Cherries	24								24
Grapes	79	7				131			188
Strawberries	40						1		41
Currants	10						2		12
Gooseberries	24	9					2		36
Raspberries	7	5					5		18
Blackberries	5								5
Quinces	3								3
Figs	1								1
Total number of varieties	521	142	177	68	30	131	17	37	847

Several shipments of magnificent apples also came from British Columbia about the same time, and their reputation went forth through the papers and brought many visitors enquiring for the big apples of British Columbia. The old Esopus Spitzenburg, that high-flavored old apple of the very choicest character, which no longer succeeds well in Ontario, was shown in perfect samples from the former Province. The same is true of that best of all dessert apples, the Fameuse, while the Ribstons and Bellefleurs were beyond criticism. To British Columbia, also, belongs the credit of showing the largest plums at the World's Fair, though closely matched by Oregon, the exhibitor of the largest apple. The shipments which came to hand about the end of September were beautiful, but unfortunately kept a very short time after their long journey.

The wild fruits shown from the North west Territories, as indicated above, were important as showing the possibilities before us of such improvements by means of hybridization, cultivation, and such arts of horticulture, as shall develop a class of fruits of considerable excellence, and yet hardy enough for the climate of that country. Present experience seems to indicate that it is to the improvement of our best native fruits, rather than to the importation of exotics, that we must look for the greatest success.

The numerous great cases containing the large and magnificent display of vegetables from the five experimental farms of the Dominion and from the various Provinces, so carefully collected under the direction of Mr. Wm Saunders, had been stored in the Produce Cold Storage, at Lake Street Bridge, in the city. At first I had supplies brought to the exhibit successively by hauled teams, but the distance was about eight miles, and the charges excessive. As soon, therefore, as the World's Fair Cold Storage was completed, which was early in June, I had the balance, two car loads, transferred to that place, whence fresh lots were brought to the tables from time to time as needed. This continued one month when, on the 10th of July, that terrible disaster occurred, in which some fifteen or twenty gallant firemen lost their lives, besides an immense loss to property, including our reserve exhibit, sufficient for two succeeding months.

It is, however, a satisfaction to know that during the month I was permitted to draw upon this splendid store of vegetables, I succeeded in placing upon the tables of our vegetable court abundant samples of nearly every kind in the collection.

VEGETABLES OF 1892.

	Ontario.	Quebec.	Nova Scotia farmers.	Prince Edward Island.	New Brunswick farmers.	Central Experimental Farm at Ottawa.	Experimental Farm at Indian Head, N. W. T.	Experimental Farm at Brandon, Man.	Canada.
Potatoes	111	4	19	8	28	17	27	22	200
Turnips	6	2	3	4	5	.....	2	1	14
Carrots	6	3	3	6	8	7	3	5	22
Mangels	3	.....	1	.....	1	1	2	3	5
Onions	5	2	.....	1	2	.....	.....	2	5
Beets	4	1	.....	3	5	3	1	1	10
Radishes	3	.....	.....	.....	.....	.....	1	1	4
Parsnips	1	1	.....	1	3	.....	1	.....	4
Kohl Rabi	.....	.....	1	1	1	.....	1	.....	1
Peas (in pods, bottled)	.....	.....	.....	.....	.....	.....	5	5	10
Peas (shelled, bottled)	.....	.....	.....	.....	.....	.....	6	.....	6
Beans (bottled)	.....	.....	.....	.....	.....	.....	.....	8	8
Rhubarb	.....	.....	.....	.....	.....	.....	.....	6	6
Total number of varieties	139	13	27	24	53	28	49	54	295

VEGETABLES OF 1893.

	Ontario.	Nova Scotia.	British Columbia.	Prince Edward Island.	Central Experimental Farm, Ottawa.	Experimental Farm at Nappan.	Experimental Farm at Indian Head.	Experimental Farm at Brandon.	Canada.
Potatoes	171	29	7	.....	37	.....	27	.....	248
Turnips	16	1	.....	1	3	.....	9	.....	24
Carrots	19	1	4	.....	12	.....	6	.....	31
Mangels	13	3	.....	2	13	.....	3	.....	18
Onions	7	1	5	.....	.....	.....	12	.....	21
Beets	13	1	.....	.....	.....	4	13	1	24
Radishes	9	.....	.....	.....	.....	.....	5	.....	9
Corn—green	21	.....	.....	.....	36	3	.....	17	53
Cauliflower	2	2	.....	.....	8	.....	1	.....	12
Parsley	.....	.....	.....	.....	.....	.....	2	.....	2
Tomatoes	5	.....	.....	.....	22	.....	.....	.....	27
Celery	4	.....	.....	.....	.....	.....	1	.....	4
Cucumbers	2	.....	.....	.....	.....	.....	5	.....	7
Beans	4	.....	.....	.....	.....	.....	9	.....	13
Peas	.....	.....	.....	.....	.....	.....	3	.....	3
Cabbages	20	1	.....	.....	.....	.....	6	.....	27
Kohl Rabi	3	.....	.....	2	.....	.....	.....	.....	5
Rhubarb	.....	.....	.....	.....	.....	.....	5	.....	5
Egg plant	2	.....	.....	.....	.....	.....	.....	.....	2
Squash	4	.....	.....	.....	.....	.....	.....	.....	4
Total number of varieties	315	39	16	5	131	7	107	18	539

The Vegetable Court was a most important feature of our exhibit, because it was not only excellent during all the season, excepting, perhaps, the month of August, when

the old vegetables that were saved from the Cold Storage disaster were exhausted and the new ones were not yet received, but also because it was practically the only important vegetable display in the horticultural building. The only others attempted were those by New York and Michigan, the latter very poor, and the former, though containing some excellent collections of radishes, tomatoes, peas, beans, onions, etc., was shown at a very great disadvantage, owing to the style of installation. In consequence, the Canadian Vegetable Court was always full of visitors, and received many favorable notices from the foreign press.

The attention of the general public was arrested by the big pumpkin and the big squash, grown by Wm. Warnock, of Goderich, and exhibited during the month of October, in the two prominent corners of the Court. The pumpkin, Stump's Mammoth Red, weighed 146 pounds, and the squash, Mammoth Green, a new hybrid, weighed 365 pounds. Mr. Warnock said there was no secret about his method of growing it, and he willingly described it for the benefit of others desiring to grow monstrosities for exhibition purposes. A compost of one horseload of hen manure and three of loamy soil was made about the 1st of April, and mixed three times during the period till the 10th of May. Then hills were made seven feet in diameter and eighteen inches deep, mixed with one-third part of compost and levelled up six inches above the level. These hills are made about twenty feet apart. The seed was sown about the fifteenth of May and the ground kept loose. As the vine began to run, it was mulched three inches deep with horse manure over the whole surface of the beds. Every branch of the vine was held down with stakes two and a half feet apart, so that they might take root more freely. As soon as a specimen set which looked promising, he pruned off all others. The specimen is best got by artificial fertilization, for bees are often late and a blossom, well fertilized, will produce a more vigorous sample. Twice a week he pruned off all new growth and continued this through the season, also cutting off all other blooms except the one. Water was very important, and it was applied twice a week with a sprayer, an hour on a plant each time of application.

One special exhibit from Ontario deserves particular notice, viz: a very fine collection of potatoes of one hundred and sixty-three varieties, sent forward by the Ontario Experimental Farm at Guelph. These and a collection of twenty-nine well chosen varieties from Nova Scotia, were prominent factors in winning us laurels for our vegetable exhibit.

The green corn exhibit from Canada was a great surprise. Fifty-three varieties, seventeen of them from the North-west Territories, were a standing wonder to Illinois and Iowa, who consider themselves almost the only corn producing countries of the world. This exhibit proved that in some parts of Canada fine varieties of corn can be produced, while even in the North-west many of the early varieties will mature.

Fruits and Vegetables in Tin Cans.

Number of varieties shown by Canadian exhibitors at the World's Columbian Exposition:

	Mrs. Parke, Prescottville, Ont.	W. Peaker & Son, Port Hope, Ont.	Copland Canning Co., Hamilton, Ont.	Lakeside Preserving Co., Picton, Ont.	Strathroy Canning Co., Strathroy, Ont.	Dale Preserving Co., St. Catharines, Ont.	Mrs. Watson, Chatham, Ont.	Various from Canada.
Fruits	2	6	4	1		4	7	24
Vegetables		6	1	3	4	6		19
Total numbers	2	12	5	4	4	9	7	43

Pickles, Catsup, Vinegar, Etc.

Number of kinds shown by Canadian exhibitors at the World's Columbian Exposition :

	North-west Territories.	British Columbia.	Mrs. Tinling, Winnipeg, Man.	Mrs. Weaver, Chatham, Ont.	Erie Preserving Co., St. Catharines, Ont.	Total from Canada.
Jellies and jams	10	.....	.....	.....	.....	10
Pickles, catsup and vinegar	.....	15	12	5	1	33
Sweet pickles	.....	.....	.....	5	.....	5
Jams from wild fruits	6	.....	.....	.....	.....	6
Total numbers	16	15	12	10	1	54

Wine Exhibit.

Number of varieties from Canadian exhibitors :

	W. D. Kitchen, Grimsby, Ont.	J. S. Hamilton, Pelee Island Wine Co., Brantford, Ont.	J. J. Purple, Halifax, N. S.	Niagara Falls Wine Co., Toronto, Ont.	John Bott, Walkerville, Ont.	Chas. Montreuil, Walkerville, Ont.	Ernest Girardot, Sandwich, Ont.	T. Beniteau, Windsor, Ont.	Total.
Wines exhibited through the Dominion	.....	6	1	.....	.....	.....	.....	.....	7
Unfermented grape juice for sacramental purposes	1	.....	.....	.....	.....	.....	.....	.....	1
Wines exhibited through the Province of Ontario	.....	.....	.....	5	2	2	5	2	16
Total numbers	1	6	1	5	2	2	5	2	24

The fruit and vegetable courts seemed to vie with each other in surprising the passers-by. In August and September, for instance, green corn was shown from the Central Farm, Ottawa, and from that at Indian Head, N. W. T. An oft-repeated remark was, "Is it possible you can grow corn in Canada, and even in the North-west?" The fact that, during a large part of the summer, Canada made the only large vegetable exhibit, was a strong point in our favor and proved the wisdom of the Dominion in providing abundantly for this exhibit in advance, so that we held our space until September, when fresh vegetables began to come in.

The fruits of Canada served as a means of placing before our foreign visitors one of the most promising industries of our country. Notes of the varieties we grow were made by gentlemen from Norway, Belgium, England, Russia and other European countries ; because such products, raised in profusion on the farm under the most ordinary conditions, revealed not only a pleasant line of occupation for the colonist, but also one of more than ordinary profit. This industry is attracting a most desirable class of

settlers, viz., young men of means, who wish to purchase fruit farms in Canada. And while fruit growers themselves do not desire an increase of fruit farmers, for fear of lessening the profits by competition, there is no doubt of the excellent results to the country at large of attracting to it a class of colonists, who have not only means, but also who are possessed of education and refinement.

There is reason to expect an increase in trade also from our fruit exhibit, because samples of Canadian apples were given to many visitors, and these united in acknowledging that, in point of flavor and color, the Ontario Spy, the Quebec Fameuse and the Nova Scotia Gravenstein were unsurpassed. Canadian peaches and pears were also pronounced superb by those who sampled them. The writer, who grows apples largely in the Niagara peninsula, was offered $4 per barrel for a car load of his Red Astrachan apples, delivered in Chicago; and, later on, the same price for Cranberry Pippins, Fameuse, Spies, Kings and other fancy varieties. Canadian apples, especially the Tolman Sweet, the Northern Spy and the Fameuse are the most popular apples in the Chicago market. Thousands of barrels of Ontario Spies have been brought to this city during the last two years by apple buyers, and sold at a profit in spite of the McKinley Bill. The Canadian Swazie Pomme Grise was also asked for by private parties, who wished to secure that choice little dessert apple for their own use.

Thus it appears that, even in the United States, in some of the great cities of the west and south, there may open up in the near future an almost unlimited market for Canadian apples of certain kinds, as, for instance, the above mentioned kinds from Ontario; and, in addition, the Baldwin, Greening, Blenheim Orange, Cranberry Pippin, Ribston, Ontario and Golden Russet; from British Columbia, the Spitzenburg, Ribston, Golden Russet, Pomme Grise, Fameuse, Maiden's Blush, Ben Davis, Wealthy and many others; and from Nova Scotia, such kinds as Gravenstein, Ribston, King, Golden Russet and Nonpareil. This latter apple is scarcely distinguishable from the Ontario Roxbury Russet. Had there been a competition for the best quality of fruit, Canada might well have contested the place for supreme excellence. One proof that she even now holds that place in the commercial markets is the lively demand for our fruits on both sides of the Atlantic. In the Liverpool market, the greatest apple market in the world, Canadian apples always bring the highest price, and, on this account, American apples are sometimes shipped through Canada, and are labeled "Canadian," in order to bring the shippers more money. In this market, during the past five years, Canadian Baldwins have averaged a higher price than New York State or Maine Baldwins, as is proved by a table of actual sales carefully prepared by Messrs. Woodall & Co., of Liverpool.

A good point was made by inviting interested persons inside the office and giving them samples of Canadian apples and grapes to test the quality. We always boast that Canadian apples are the highest flavored apples grown, and this was the best way to prove it. The Montreal Fameuse was especially selected and a barrel kept in reserve. The universal verdict was in its favor, common expressions being, "Delicious," "The best I ever tasted," "Better than any American apple," etc., etc.

Among the lessons to be learned from the Horticultural Exhibit at the World's Fair is the evidence that every apple has its home, where it may be grown to the greatest perfection. Thus, the Ben Davis, a comparatively poor apple in Canada, and one not to be much commended to orchardists, is at home in the State of Idaho, and, as grown there, is so large and highly colored that it is the most profitable apple that can be grown, while our Canadian Spy is a comparative failure. The Baldwin is a failure in Illinois and a success in Maine and in Canada. The Green Newtown Pippin is a success in Pennsylvania, and as grown there is a grand success, it being the highest priced apple in the British market; but the same apple is not profitable in Canada. One point is noteworthy, that the farther north an apple can be successfully grown the better the quality and the higher its color. Here then is Canada's opportunity. Her orchardists need to select such varieties as are proved by this World's Fair to be grown to the highest perfection in Canada. No further exhibitions, in which Canada has a part at all, should lack in a first class fruit exhibit. Fruit growing is one of her leading industries, more especially in the older provinces, and, while agricultural exhibits may attract emigrants to settle upon her free grant lands of the North west, a horticultural exhibit,

especially of fruits, will tend to attract to the older provinces the sons of a wealthy class who bring wealth and refinement along with them. One thing should not be forgotten, viz., that a fruit exhibit cannot be made at any moment, but must be prepared a year in advance, in order to have an exhibit through the early part of the season.

Many mistakes are made by shippers in the selection of fruit for exhibiting. Apples and pears lacking in color, with stems off, blemished with spot, curculio or worm, are often forwarded; a great mistake, for the judge takes off points for each such imperfection.

The packing, too, is often bad. Plums, for instance, were sent in cork dust and heated on the way, when they should be carefully rolled in tissue paper and packed closely in narrow crates. A convenient sized package for shipping plums and peaches for exhibition is made as follows: Sides, four pieces $\frac{1}{4}$ inch stuff, 20 inches by $5\frac{3}{4}$ inches; top and bottom, two pieces, 4 inches by 20 inches; ends, two pieces, $\frac{1}{2}$ inch stuff, $4\frac{1}{2}$ inches by $11\frac{3}{4}$ inches. Pack from top (the narrowest side) and open on side.

The same package would be most desirable for extra samples of peaches and plums for an appreciative market. It is used by California, and the care exercised by California fruit growers in selecting, grading and packing their pears and peaches has gone a long way toward bringing them the reputation and consequent high prices which they have earned in the markets of the East.

The importance of exhibiting *large masses* of special varieties of apples is plainly manifest for making an impression on visitors at a World's Fair. A plate of two of a single variety, no matter how excellent, attracts no attention from people walking through miles of exhibits; but when we showed a hundred plates of a single variety, as in the case of the Nova Scotia Gravenstein, or a large cone of beautiful apples, as, for instance, the one Mr. Bigelow, of Nova Scotia, made of his King apples, they were the admiration of all, and drew especial attention to the Province that produced them. An abundant supply of the finest commercial apples should be shown and inferior ones should be left at home, and not sent forward simply for the purpose of increasing the number of varieties on exhibition, for every poor sample lowers the average percentage of excellence scored by the whole exhibit.

Floricultural Exhibit.

	Height. ft.	Spread. ft.	Leaves No.
Sir D. L. Macpherson, Chestnut Park, Toronto.			
1. Adiantum Santa Catharina, West Indies*			
2. Buonapartea juncifolia, Mexico	3		
3. Asplenium bulbiferum, New Zealand			
John Hoskin, Esq., Q.C., Rosedale, Toronto.			
4. Kentia Balmoreana, New Guinea	12	12	19
Waterworks Reservoir, Summerhill Avenue, Toronto.			
5. Ficus Parcelli, Polynesia	5	3	
6. Cycas revoluta, China	4	6	90
7. Latania Borbonica, South China	10	15	5
8 to 11, 4 Crotons (various)	4		
12. Nephrolepis exaltata			
Horticultural Gardens, Gerrard Street, Toronto.			
13. Livistonia Australis	6	12	36
14. Latania Borbonica, South China	4	5	8
15. Pandanus Veitchii, Polynesia	4	4	
16. " Utilis, Madagascar	4	4	
17. Cycas revoluta, China	3	4	22

*The country named after each plant is that from which it was originally introduced.

Normal School, St. James' Square, Toronto.

18. Ficus elastica, East Indies	10	11	
19. Dracæna Youngii	4	4	
20. Areca lutescens, Maritius (7 brakes)	6	6	
21 and 22. 2 Cureuligo recurvata, East Indies			
23. Casuarina equisetifolia, Australia	12	5	
24. Latania Borbonica, South China	4	5	13
25. Phyllocactus latifrons, Mexico	12	10	
26. Nephrolepis exaltata			
27. " davalloides furcans			

Government House, King Street, Toronto.

28. Araucaria Cunninghami, Moreton Bay	18	5	
29. " Bidwellii,	10	10	
30. Livistonia Australis	7	7	21
31. Aspidistria lurida var., Japan	3	5	
32. Cycas Circinalis, East Indies	4	10	

Exhibition Park, Dufferin Street, Toronto.

33. Ceroxylon nivea, Brazil	4	4	5
34. Latania Borbonica, South China	5	8	21
35. "	6	10	10
36. Pandanus Veitchii, Polynesia	7	8	
37. Kentia Fosteriana, New Guinea	6	6	6
38 and 39. 2 Crotons (various)	5		
40 and 41. 2 Crotons	4	3	
42. Aspidistria lurida var. Japan	3		
43. Latania Borbonica, South China	4	5	10
44. Carludovica atravirens, Tropical America	2		
Many small ferns			

Central Prison, Strachan Avenue, Toronto.

45. Areta rubra, Mauritius	18	15	16
46. Salad Andersoni	18	10	12
47. Latania Borbonica, South China	6	14	18
48. Pandanus Veitchii, Polynesia	4	5	
49. Dracæna Massangeana	7		
50. " Lindeni	5		
51. " neo caledonica	4		
52. " Amabilis	3		
53. " Baptisti	3		
54. Kentia Balmoreana, New Guinea	5	4	8
55. Pandanus utilis, Madagascar	5		
56. Areca lutescens, Mauritius (5 bushes)	6	4	
57. Kentia Fosteriana, New Guinea	8	5	8
58. Areca Baueri, Norfolk Island	5	4	5
59. Cycas Circinalis, East Indies	5	5	13
60. Phœnicophorium sechellarum, Seychelles	3	2	3
61. Dracæna rubriva, New Zealand	5	4	
62. Carludovica atravirens, Tropical America	3		
63 and 64. 2 Yucca aloifolia var. West Indies	3		
65. Papyrus antiquorum, Egypt	3		
66. Cereus nycticalus, Mexico	4		
67 70. 4 Maranta zebrina			
71. Pteris Wallichiana			
72. " Smithsoniana			
73. Nephrolepis exaltata			
74. Onychium japonicum, Japan			
75. Verschaffeltia splendens, Seychelles			
Many small ferns and Palms			

The Asylum, Queen Street, Toronto.

76. Rhapis flabelliformis, China	4		
77. Latania Borbonica, South China	5	6	7

Ontario Agricultural College, Guelph.

78. Pandanus utilis, Madagascar			
79. Phœnix dactylifera, India, Levant			
80. " Canariensis			
81. Eucalyptus globulus, Australia			
82. Rhapis flabelliformis, China			

Messrs. Manton Bros., Florists, Toronto.

83-88. 6 Dracœna Indivisa, New Zealand.....
Many small ferns .....

Mr. F. G. Foster, Florist, Hamilton.

89. Kentia Balmoreana, New Guinea.....
90. " Fosteriana " .....
91. Phœnix reclinata, India.....
92. Areca lutescens, Mauritius .....
93. Latania Borbonica, South China .....
94. Dracœna Lindeni .....

This exhibit was given a very prominent place in the dome and was counted very fine by experts in floriculture. It was cared for by first-class florists from Toronto and was, therefore, kept in the best possible condition.

From the Central Experimental Farm, Ottawa, there was shown a very fine collection of thirty five varieties of evergreens, which served an excellent purpose during August, and September in decorating the tables when the stock of fruit is at the lowest. A full list of these may be seen in the catalogue.

In addition to the above exhibits, there was also a very fine collection of Canadian horticultural literature, containing the reports of the Nova Scotia Fruit Growers' Association, thirteen volumes; a book entitled "The Canadian Fruit, Flower and Kitchen Gardener" by D. W. Beadle of Toronto; a set of fourteen bound volumes of the "Canadian Horticulturist;" a set of twenty-five reports of the Ontario Fruit Growers' Association, and a collection of fine photographs giving excellent views of some representative Canadian fruit farms. These, coupled with the products of farms and gardens, gave the visitor a very correct conception of the progress of horticulture in Canada. British Columbia showed a map of that province, a very commendable feature, for nine-tenths of the visitors would otherwise have had no idea of its situation, much less of the location of its towns, rivers or fruit centres. I am of the opinion that at future exhibitions an important feature in both agricultural and horticultural courts should be a well executed map of each province, not too large, but clearly marked to indicate those localities where the products shown may be successfully grown.

Thus, in every way, I have endeavored to impress our visitors with some adequate notion of the high position occupied by Canada, both practically and theoretically in horticultural pursuits, and I am confident that, in a large degree, this effort has achieved signal success.

In closing, I submit the list of awards in horticulture, which must be gratifying to every loyal Canadian. That Canada should carry off over sixty awards and medals, besides many "Honorable Mentions" in the Department of Horticulture alone speaks volumes for her fruits and vegetables as compared with those shown by other countries when viewed by expert judges. The Province of Ontario alone took thirty-four awards in fruit—by far the largest number taken by any exhibitor.

List of Awards.

Name of Exhibitor.	Exhibit.
Department of Agriculture, Ottawa.....	General Collection of Vegetables from her Experimental Farm.
Central Experimental Farm, Ottawa	Collection of Vegetables.
" "	" Grapes.
Experimental Farm, Brandon, Man.....	" Vegetables.
" "	" " in solution.
" Nappan, N.S.....	" Vegetables.
" "	" " from New Brunswick farmers.

List of Awards.—*Continued.*

Name of Exhibitor.	Exhibit.
Experimental Farm, Agassiz, B. C.	Collection of Apples.
" Indian Head, N. W. T.	" Vegetables.
Mrs. Tinling, Winnipeg, Man.	" Pickles.
Ontario Canning Company, Hamilton, Ont.	" Canned Fruits.
W. Boulter & Son, Picton, Ont.	" "
The Fruit Growers' Association of Ontario, office at Grimsby.	Horticultural Publications.
W. D. Kitchen, Grimsby, Ont.	Unfermented Grape Juice.
Province of Ontario, Toronto	Grapes.
" "	Apples of 1892.
" "	" 1893.
" "	Pears and Quinces.
" "	Stone Fruits.
" "	Cherries.
" "	Currants.
" "	Gooseberries.
" "	Blackberries.
" "	Fruits in Solution.
" "	Collection of Vegetables.
" (Niagara District) Toronto	Grapes.
" " "	Pears.
" " "	Apples.
" (Burlington District), "	Grapes.
" " "	Apples.
" " "	Pears.
" (Wentworth District), Toronto	Grapes.
" " "	Apples and peaches.
" " "	Pears.
" (Essex District) "	Pears and peaches.
Province of Ontario (Belleville and Eastern Districts), Toronto, Ont.	Apples.
Province of Ontario (Grey District), Toronto, Ont.	"
" (Huron " "	"
" (Simcoe " "	Apples and Pears.
" William Rennie, "	Turnips and Mangels.
" Jas. Shepherd & Sons, Queenston	Peaches.
" W. R. Read, Port Dalhousie	"
" C. Atkins, Stony Creek	"
" W. Kottmeier, St. Catharines	"
" E. Tyhurst, Leamington	"
" Geo. W. Cline, Winona	Plums.
" Wm. Stewart, Goderich	"
" Wm. Warnock, "	"
" W. M. Orr, Stony Creek	"
" R. Trotter, Owen Sound	"
" Mrs. A. M. Cody, Tilsonburg, Ont.	Botanical Collection.
"	Collection of Plants
Province of Quebec, Quebec	Apples of 1892.
" "	Fruits in Solution.
Province of Quebec, Missisquoi Horticultural Society, Frelighsburg	Apples of 1893.
Province of Quebec, Missisquoi Horticultural Society, Frelighsburg	Grapes.

List of Awards.—*Concluded.*

Name of Exhibitor.	Exhibit.
Province of Quebec, Geo. B. Edwards, Covey Hill	Apples of 1893.
Province of British Columbia, Victoria	Collection of Apples.
" "	" Plums.
" "	" Vegetables.
Province of Prince Edward Island, Charlottetown	" Apples.
" " "	" Vegetables of 1892
The Fruit Growers' Association of Nova Scotia, Wolfville.	Apples of 1892.
" " " "	Apples and pears of 1893.
J. W. Bigelow, Wolfville	Apples.

Mr. E. Hutcherson of British Columbia contributes the following Act, designed to provide for the destruction of various diseases and insects, from which possibly we may gain some useful hints :

THE HORTICULTURAL BOARD ACT OF BRITISH COLUMBIA.

Her Majesty, by and with the advice and consent of the Legislative Assembly of the Province of British Columbia, enacts as follows :

1. This Act may be cited as the "*Horticultural Board Act, 1892.*"

2. There is hereby created a Provincial Board of Horticulture, to consist of six members, who shall be appointed by the Lieutenant-Governor in Council, one from the Province at large, and one from each of the horticultural districts which are hereby created, to wit :—

1. The First District shall comprise the Electoral Districts of Victoria, Victoria City, Esquimalt, and Cowichan.

2. The Second District shall comprise the remaining Electoral Districts of Vancouver Island, and The Islands.

3. The Third District shall comprise all of New Westminster Electoral District south of the Fraser River :

4. The Fourth District shall comprise the Electoral districts of New Westminster City, and of Vancouver City, and New Westminster Electoral District north of the Fraser River, and the Electoral District of Cassiar :

5. The Fifth District shall comprise all the rest of the Mainland of British Columbia.

3. The members shall reside in the districts for which they are appointed ; they shall be selected with reference to their study of and practical experience in horticulture, and the industries dependent thereon ; they shall hold office for a term of four years, and until their successors are appointed and qualified : Provided, however, that three of the Board first appointed (to be determined by lot) shall retire at the expiration of two years. All vacancies in the Board shall be filled by appointment of the Lieutenant-Governor in Council, and shall be for the unexpired term.

4. The Lieutenant-Governor in Council may appoint a Secretary, prescribe his duties, and may also appoint a Treasurer, who shall give a bond to the Lieutenant-Governor in Council in the sum of one thousand dollars for the faithful performance of his duties. The Secretary and Treasurer shall hold their appointments at the pleasure of the

Lieutenant-Governor in Council. Before entering upon the discharge of his duties, each member of the Board shall take and subscribe to an oath of allegiance, and to faithfully discharge the duties of his office, which said oath shall be filed with the Provincial Secretary.

5. The Board shall receive, manage, use, and hold donations and bequests of money and property for promoting the subjects of its formation; it shall meet in the months of April and October of each year, and as much oftener as it may deem expedient, for the consultation on and for the adoption of those measures that will best promote the horticultural industry of the Province; it may, but without expense to the Province, select and appoint competent and qualified persons to lecture in each of the districts named in section 2 of this Act, for the purpose of encouraging and improving practical horticulture, and imparting instruction in the best methods of treating the diseases of fruits and fruit trees, cleaning orchards, and exterminating orchard pests.

6. The office of the Board shall be located at such a place as the majority thereof may determine; it shall be kept open to the public, subject to the rules of the Board, every day excepting Sundays and public holidays, and shall be in charge of the Secretary during the absence of the Board.

7. For the purpose of preventing the spread of contagious diseases among fruits and fruit trees, and for the prevention, treatment, cure, and extirpation of fruit pests and the diseases of fruits and fruit trees, and for the disinfection of grafts, scions, or orchard débris, empty fruit boxes or packages, and other suspected material or transportable articles dangerous to orchards, fruits, and fruit trees, said Board may suggest regulations for the inspection and disinfection thereof, which regulations shall be circulated in printed form by the Board among the fruit-growers and fruit dealers of the Province, and shall be published at least ten days in two daily papers of general circulation in the Province, and shall be posted in three conspicuous places in each district, one of which shall be at the County Court House thereof.

8. The Lieutenant-Governor in Council shall appoint, from the number of the Board or from without their number, to hold office at the pleasure of the Lieutenant-Governor in Council, a competent person especially qualified by practical experience in horticulture, who shall be known as "Inspector of Fruit Pests." It shall be the duty of said Inspector to visit the horticultural districts of the Province to see that all the regulations of said Board to prevent the spread of fruit pests and diseases of trees and plants injurious to the horticultural interests of the Province, and for the disinfection of fruit, trees, plants, grafts, scions, nursery stock of all description, orchard débris, empty fruit boxes and packages, and other material, be made known to the people of the Province; he shall, whenever required, and under the direction of the Lieutenant-Governor in Council and of the Board, and may also upon his own motion, and upon complaint of interested parties, inspect orchards, nurseries, and other places suspected or believed to be infested with fruit pests, or infected with contagious diseases injurious to trees, plants, or fruits, and he shall report the facts to the Board. The Inspector shall, from time to time and whenever required by said Board, report to it such information as he may secure from observation, experience, and otherwise, as to the best method of diminishing and eradicating fruit pests and diseases from orchards, and also suggestions as to practical horticulture, the adoption of produce suitable to soil, climate, and markets, and such other facts and information as shall be calculated to advance the horticultural interests of the Province. "The Inspector shall from time to time, under the direction of the Board, hold meetings throughout the Province in the interests of horticulture, and impart such information and instruction to fruit growers and farmers as may tend to the improvement and expansion of the fruit industry of the Province."

9. Whenever a complaint is made to any member of the Board that any person has an orchard, trees, or nursery of trees, or a fruit packing house, store room, sales room, or any other place in this Province infected with any noxious insects, or the eggs or

larvæ of any such insects, or that any packages of trees, plants, or fruit arriving in this Province, or in this Province about to be disseminated, which are known or suspected to be from localities that are infected with any disease or pest injurious, or that may become injurious, to the fruit interests of the Province, such member shall inspect, or cause to be inspected, the premises or property to which such complaint relates, and if the same be found to be infected as aforesaid, such member shall notify, in writing, the person having charge of such premises and property to appear before him at such time and place as specified in such notice, to be heard in reference to the infection of such premises or property aforesaid, and such property shall not be removed after the person in charge of the same shall have been notified in writing as aforesaid without the written permission of a member of the Board and whether the person notified to attend is present or not. If such member shall be of the opinion that such premises or property or any of the same, are infected as aforesaid, he shall notify, in writing, the person in charge of the same, within a time to be prescribed in such notice, to treat and disinfect said premises or property in the manner presented in said notice, and if the person so notified shall neglect or refuse to treat and disinfect the said premises or property, in the manner and within the time prescribed in the said notice, such person shall be liable to a fine of not less than ten dollars nor more than one hundred dollars, to be recoverable on summary conviction before a Justice of the Peace; and if it appears on the trial that any orchard, trees, nursery, building, or any other structures, premises, or property in charge of the defendant referred to in said notice, or any part of such structure, premises, or property, is infested or affected as aforesaid, the Court shall declare whatsoever of the same is so infected a nuisance, and shall order it to be abated, or may make any other order necessary to prevent its continuance, and it shall be the duty of the Board, or some member thereof, to execute such order, and the costs and disbursements of the prosecution shall be adjudged against the party convicted as aforesaid.

10. It shall be the duty of the Secretary to attend all meetings of the Board, and to procure records of the proceedings and correspondence, to collect books, pamphlets, periodicals and other documents containing valuable information relating to horticulture and to preserve the same; to collect statistics and other information showing the actual condition and progress of horticulture in this Province and elsewhere; to correspond with agricultural and horticultural societies, colleges and schools of agriculture and horticulture, and other persons and bodies, as he may be directed by the Board; and prepare, as required by the Board, reports for publication; he shall also act as assistant to and obey the directions of the Inspector of Fruit Pests, under the direction of the Board, in the exercise of the duties of his office, and shall be paid for his services as said Secretary and Assistant Inspector a salary to be fixed by the Board, and his mileage actually paid out shall be allowed when acting as assistant to the Inspector of Fruit Pests.

11. The Board shall annually, in the month of January, report to the Minister of Agriculture a statement of its doings, with a copy of the Treasurer's account for the year preceding, and abstracts of the reports of the Inspector of Fruit Pests, and of the Secretary. The members of the Board shall receive as compensation for their services their mileage actually paid out when attending the meetings of the Board, and shall be allowed a sum not exceeding five dollars a day for time actually employed, to be fixed by the Lieutenant-Governor in Council.

12. The Treasurer shall receive all moneys belonging to the Board, and pay out the same only for bills approved by it, and shall render annually a detailed account to the Board of all receipts and disbursements.

13. The said Board shall, when making its annual statement, report to the Minister of Agriculture what (if any) legislation is needed in aid of the horticultural and fruit-growing interests of the Province.

14. The powers and duties devolving by this Act upon the said Board and the Inspector of Fruit Pests in relation to fruit and fruit trees, are hereby extended to hops and hop plants, for the purpose of preventing the spread of disease among hops and hop plants, and of extirpating any pests affecting the same.

15. Notwithstanding anything in the said Act contained, it shall be lawful for the Lieutenant-Governor in Council, at discretion, from time to time, to assign the performance of the duties of the Secretary of the Board to the Inspector of Fruit Pests, and to remunerate the Inspector accordingly.

PUBLIC NOTICE.

Pursuant to Section 7 of the above Act, the following notice is published in the fruit growing district of British Columbia.

Notice.

Rule 1. All agents, dealers, nurserymen, or persons importing, selling, or distributing nursery stock, as well as all trees, plants, and fruit, (unless they have in their possession a certificate from the Horticultural Board that their property is free of pests) before distributing, offering for sale or disposing of any article as above mentioned, shall notify the member of the Board, his agent or representative in whose district any such article is found, or the Secretary or Inspector of this Board, who shall inspect or cause to be inspected said nursery stock, trees, plants, or fruit, and if they are found to be free from pests shall issue a certificate to the owner or person in charge, stating said articles appear free from injurious insect pests.

Rule 2. All persons possessing, forwarding, or distributing trees, plants, nursery stocks, or fruit infested with any insect such as: Woolly aphis, apple tree aphis, scaly bark-louse, oyster-shell bark-louse, San Jose scale, red scale borers, currant worms, or other known injurious insects shall have the same disinfected and cleansed of such insects before forwarding, distributing, selling or disposing of said trees, plants or fruit.

Rule 3. The Board demand that all boxes or crates which have been used in the importation of fruits or nursery stock into this Province shall be immediately broken up and destroyed by fire, whereby growers will avoid the expense of disinfecting, which it is incumbent on the members of the Horticultural Board or their agents to enforce. The following method will be considered sufficient for disinfecting boxes, etc.: By dipping them in boiling water containing not less than one pound of concentrated lye or potash to every ten gallons of water, and submerging said material not less than five minutes.

Rule 4. Nursery stock or any trees or plants infested by any insects as included in Rule 2, shall be disinfected by dipping in a solution prepared as follows: Take three pounds of soap (whale oil or good home made soap), three pounds sulphur and one pound Gillett's concentrated lye, or lye of equal strength and purity, boil one hour in four gallons of water, add one gallon coal oil, then boil slowly twenty minutes and add twenty five gallons of water.

Rule 5. Where insect pests, such as are mentioned in the British Columbia Fruit Growers' Supplement for 1893, or other known injurious insects, are found to exist, spraying must be done and other remedies applied during the growing season, while the trees are in leaf, as shall be recommended by the Board from time to time, so that the insects can at least be held in check until the stronger washes of the dormant season can be safely applied.

Rule 6. Where hop fields are infested with the hop louse spraying must be done as shall be recommended by the Board.

Rule 7. Horticultural and Fruit Growers Societies are requested to work in harmony with this Board, and may, without expense to the Board, elect from their number

one or more persons to act as local Inspectors or Advisers, who shall report to the member of the Horticultural Board of the district in which such Society is located, or to the Secretary or Inspector of the Provincial Board, cases where trees or plants are infested, and the owner or person in charge refuses to obey the directions of the Society in carrying out the rules of the Board, also any other matters of importance to the interests of said Society.

Rule 8. All members of the Board are hereby authorized to inspect any garden, orchard, trees or nursery of trees, fruit, packing-house, warehouse, store-room, sales-room, or any other place in the Province liable to be infested with any noxious insects or eggs or larvæ of any such insects, in order to satisfy themselves that the rules and regulations of the Board are duly observed.

Rule 9. Any person having infested material, trees, plants, fruit or packages, and refuses or neglects to take action to have the same disinfected, or pests exterminated, after due notice has been given, shall be deemed guilty of an offence against the Act, and shall be dealt with according to law.

By order of the Board,

E. A. Carew-Gibson,
Acting Secretary.

Office of the Provincial Board of Horticulture,
Victoria, 26th October, 1893.

THE WORLD'S HORTICULTURAL SOCIETY.

Immediately following the World's Congress on Horticulture at Chicago in August last, a series of meetings was held to consider the advisability of organizing a horticultural society which shall include every country of the globe. After much discussion, in which many eminent men from various parts of the world engaged, the World's Horticultural Society was organized and the election of the three general officers was held, on the 25th of August. This new society is designed, in the language of the constitution, "to promote correspondence and to facilitate exchange of plants and information between the countries of the world." This society can co-ordinate and extend the work of all existing societies, compile statistics, promote legislation and education, prepare correspondence directories, diffuse all the latest information from the various parts of the globe, consider means of transportation, and facilitate the exchange of varieties and every commodity in which pomologists, viticulturists, florists, vegetable gardeners, and other horticulturists are interested. The society will probably meet occasionally at the various International Exhibitions, upon which occasions, also, it can greatly aid in procuring exhibits from all parts of the world.

The general charge of this great society resides in three officers: The president; vice-president at large; secretary-treasurer at large. There is to be a vice-president and a secretary-treasurer for each country, who shall direct the affairs of the society in their respective countries. The officers elected at Chicago upon the 25th of August, 1893, were: Prosper J. Breckmans, A. M., Augusta, Georgia, U. S. A., president, a native of Belgium, but for many years a prominent pomologist and nurseryman of the United States, where he is now president of the American Pomological Society; Henri L. de Vilmorin, Paris, France, vice-president, a distinguished horticulturist, scientist and author, who is favorably known throughout the world; George Nicholson, secretary-treasurer, Curator of the Royal Gardens, Kew, England, everywhere known as the author of the incomparable Illustrated Dictionary of Gardening. Later, the president appointed William F. Dreer of Philadelphia, vice-president for the United States, a man long and favorably known in the seed trade; and Mr. Dreer appointed Professor L. H. Bailey, Cornell University, Ithaca, N.Y., secretary-treasurer for the United States. At

this juncture, Mr. Nicholson declined the office of secretary-treasurer at large, as it would be inconsistent with his present duties. This is a source of great regret to his many friends and admirers. Until a successor is elected, the secretary-treasurer for the United States has consented to act in the capacity of general secretary-treasurer.

The society now requests the earnest and early support of its friends. The vice-presidents of the various countries will be announced soon, and the organization will then be quickly completed. The society needs the co-operation of every enlightened horticulturist and every important horticultural organization.

PROSPER J. BERCKMANS, President,
Augusta, Georgia, U.S.A.

HENRI L. DEVILMORIN, Vice-president,
No. 22, Avenue de la Bourbonnais, Paris, France.

L. H. BAILEY, Ithaca, N.Y., U.S.A.,
Secretary-treasurer for the United States,
And temporary Secretary treasurer at large.

The initial membership fee for North America is $2, which also covers the dues for the remainder of the current year. Thereafter, the dues are $1 a year. Every American horticulturist should identify himself with this organization; and every state or district society should do the same. Remittances from the United States should be sent to the secretary at Ithaca, N.Y.

CONSTITUTION.

This body shall be known as the World's Horticultural Society.

The object of this society shall be to promote correspondence and to facilitate exchange of plants and information between the countries of the world.

The membership of this society shall be composed of societies in the various countries and of individuals, who shall subscribe to its constitution and pay the membership fees.

The officers of this society shall consist of a president, first vice-president, and a secretary-treasurer; also a vice-president and a secretary-treasurer in each country, independent state or province, whenever suitable persons can be found who are willing to undertake the duties of such offices. The officers shall constitute an executive committee, which may call meetings on such occasions of interest as may be deemed worthy.

The term of office of all officers of this society shall be three years, and until their successors are duly elected and qualified.

The vice-president in each country shall be appointed, at the outset, by the president of the World's Horticultural Society, after conference with the foreign representatives at the World's Columbian Exposition, or upon correspondence with horticulturists in the various countries.

The vice-president of each country shall appoint the secretary-treasurer for that country.

The fee for societies shall be $5 annually, or as near that amount as the currency of the country readily admits. The initial fee for individuals shall be $2, or approximately that amount, which fee shall also be the dues for the remainder of the current calendar year. The annual dues thereafter shall be one-half that sum.

The funds shall be spent by the executive committee for the necessary expenses of the society, which shall allow one-third of all the collections in each country to be retained there for its own expenses and to be disbursed by its own secretary, except in the country represented by the president, where all the funds collected shall be retained, but that country shall pay its share of the general expenses. The executive committee has power to publish a periodical of the size and frequency of issue warranted by the funds, and which shall be sent free to all members of the society. In the absence of meetings of the executive committee, the president, first vice-president, secretary-treasurer, and the secretary-treasurer of the country represented by the president, shall constitute a finance committee, which shall audit the accounts of the society, any two of whom shall constitute a quorum.

The president, first vice-president, secretary-treasurer, and secretary-treasurer of the country represented by the president, constitute the committee on by-laws of the World's Horticultural Society, any two of whom shall constitute a quorum.

Adopted by a meeting of horticulturists of various countries, in Chicago, Aug. 25, 1893.

APPENDIX II.

REPORTS OF AFFILIATED SOCIETIES.

REPORT OF THE BURLINGTON HORTICULTURAL ASSOCIATION, 1893.

This society has again to report a successful year.

The membership now numbers over sixty, which shows a substantial increase for the year. Four meetings have been held which were well attended, and in the proceedings of which a strong interest was taken.

Several papers were read and addresses given which elicited lively discussion.

As it is the custom of the society, the usual annual outing was taken. This year the members visited the plum and grape plantations in the vicinity of Stony Creek, meeting with a kind reception from the proprietors, and receiving as well as giving many valuable points as to culture and marketing of fruits. A Society Exhibit was made at the Industrial Fair, Toronto, at which we were awarded first prize. By means of municipal grants a great deal of fruit of every variety grown in this district was sent to the World's Fair, Chicago. A competent fruit man was engaged to collect, sort, pack and ship suitable fruit throughout the season, commencing with the earliest strawberries and continuing on through with the various fruits as they matured to the close.

This was his sole work, so that, obviously, a large quantity of fruit found its way to Chicago.

At the date of writing no official notice of results has reached us, but, from the press reports of awards made this district certainly stands high.

OFFICERS.

The following are the officers of the association for 1893

President: Geo. E. FISHER, Freeman P. O.

Vice-President: J. S. FREEMAN, Freeman P. O.

Secretary-Treasurer: A. W. PEART, Freeman P. O.

Assistant Secretary: GEO. N. PEER, Freeman P. O.

Directors—Apples, Edwin PEART; Grapes, C. N. DYSE; Small Fruit, ALEX. REACH; Peaches and Pears, W. F. W. FISHER; Plums, C. G. DAVIS; Vegetables, E. TURNER; Shipping, JAS. LINDLEY.

Executive Committee: Pr. HUSTANS, ALEX. REACH, P. MCCULLOUGH.

Entertainment Committee: The President, Vice President, and Secretary Treasurer.

Auditors: GEO. N. PEER, and C. N. DYSE.

REPORT OF FRUIT GROWING IN 1893 ABOUT BURLINGTON.

The following paper was sent in by Mr. Geo. E. FISHER, President of the Burlington Fruit Growers' Association (affiliated).

To the Secretary of the Ontario F. G. A.

SIR:—In responding to your request I have much pleasure in submitting the following brief report of the fruit crop of 1893 and of the present condition of orchards in the Burlington district.

Apples were upon the whole a light crop, of fair size and very highly colored. Greenings were more plentiful than any other variety, Baldwins and Ribstons next; these three being our most profitable varieties year after year. Some orchards situated near the lake gave an average yield. One gentlemen, the Rev. Mr. Watt, picked fourty-four bushels of Baldwins from one tree—a pretty good yield for last year. In going back from the water the quantity decreased rapidly and beyond a distance of probably three miles there were very few apples. Spraying is pretty generally resorted to, and where that was practiced there was not an unusual proportion of worms and very little scab. The foliage was not heavy but healthy, and the growth of wood, though not large, was well matured; and this may be said of all our fruit trees.

The yield of pears was probably sixty per cent. of that of 1892. The fruit was smaller and more knotty. The scarcity and poor quality of the Duchess was remarkable, as of late years we have had full crops and splendid samples of this variety. Bartletts did fairly well. The Lawrence and Vicar gave very large crops, but the Anjou and many other varieties were short. Blight was more prevalent than usual and many young trees showed the effect of the previous winter's frost.

Plums were a good crop, well developed and unusually free from rot. The curculio did much damage where spraying had been neglected, but where this had been carefully attended to it caused no trouble. Large plantations of both plum and pear trees have been made here, but while the blight has destroyed many pear trees, our plum trees have escaped serious injury from black knot.

Peaches have not been planted largely, but occasionally a few hundred trees are found together. The disease known as the yellows has not been troublesome. The steady cold of the preceding winter held the buds in check till spring opened, resulting in a full crop of exceedingly fine quality.

Grapes were an immense crop, of exceptional size and flavor. We have had very little mildew; the vines are very thrifty and the wood is well matured.

Strawberries yielded a large crop and were a good sample. Michel's Early made more money than any other variety. Monmouth, the largest early berry grown here, did very well. Considerable experimenting with new varieties is being done. New beds have run well. Some growers are discouraged by low prices, but these have only old varieties, which were unprofitable, while large fruits sold well.

Raspberries, blackberries, gooseberries, red and black currants gave heavy crops, made plenty of wood and promise well for another year.

BRANT HORTICULTURAL SOCIETY.

Officers.

President: Lyman Chapin, Brantford.

Vice-President: Chas. Grantham, Cainsville.

Secretary-Treasurer: D. M. Lee, Paris, Ont.

Directors: J. R. Howell, Brantford; T. A. Ivey, Brantford; Chas. Grantham, Cainsville; David Greig, Cainsville; David Westbrook, Cainsville; Jas. Miller, Paris; H. J. Bryan, Mohawk; G. R. Coon, Norwich; John A. Eddy, Scotland.

A meeting of the Brant County Fruit Growers' Association was held in the Town Hall in the Town of Paris, on Tuesday afternoon, January 29th, 1894.

There was a good attendance present, and much interest manifested in the subjects under discussion. The session was opened by the President, Mr. Lyman Chapin, of Brantford, whose remarks were very appropriate and practical.

The Mayor of Paris, Mr. J. H. Fisher, welcomed the Association to Paris, and complimented the work which had been done by it in encouraging the development of the industry about Paris.

A paper on Window Gardening was given by T. A. Ivey, of Brantford, which is as follows:

WINDOW GARDENING.

A knowledge of the habits or requirements of the plants desirable for window gardening, either inside or out, is of first importance, as without this knowledge fine healthy plants from the greenhouse or conservatory are often ruined in a very short time; not through any lack of interest on the part of the grower, but simply through wrong treatment, in which, it may be, only one essential element is lacking for the health of the plant. For instance, suppose a palm, a fine healthy specimen, is brought into the house-window from the greenhouse, where it has been grown in a nice even temperature of say fifty-five degrees at night, and perhaps ten to fifteen degrees higher during the day, and all its other requirements as to moisture, ventilation, etc., had been carefully looked after by the florist. Now, suppose this same palm is handled in its new quarters in the window by one anxious to keep it looking nice. It is kept nicely watered, and perhaps every day the temperature may be as near as can be the same as it had in the greenhouse, the moisture at the roots about the same, and the amount of light about the same. It is in the same soil, in the same pot, but it soon shows signs of going back. The leaves become withered and the plant generally looks sick. There is probably just one cause of trouble, viz., the condition of the atmosphere of the room as to moisture. The plant had grown in a moist atmosphere in its greenhouse quarters. The change in this respect is very great in its new situation in the house, the air being very dry there. I have recently tested this in two specimens of palms taken from the greenhouse to the dwelling. One was watered in the ordinary way at the root. The other was watered at the root in the same way, but in addition was carefully sprayed all over every day. This last retained its fresh look all right, while the other speedily withered its leaves and looked like dying and had to be returned to the greenhouse to recover. I think this establishes what I said at the beginning. It is necessary to know the requirements of our plants as to moisture, heat, ventilation, light, soil, etc., the difference being considerable in different plants. Let no one imagine that he can grow successfully a large variety of plants in exactly the same surroundings and with the same general treatment. In our greenhouses we have a considerable range of temperature, and can vary the amount of light and moisture in different parts of the house, and can thus vary the treatment of plants according to their natural requirements to a great extent. This affords the florist in charge opportunities for the exercise of his brains. He must select the portion of the greenhouse with a low temperature for plants requiring less heat, while the hotter portions will receive the plants requiring high temperature, and so on. The care of house plants and window gardening will call forth the ingenuity of the grower to produce the same conditions as near as possible. This at first sight looks like a very difficult thing to do, but it is said "Where there is a will there is a way," so with the will in the right direction it is possible to accomplish much. It will be first necessary to find out what your plants really do require on the lines above referred to. Then, next in order is to study your house, its different apartments, and the conditions of heat, light, moisture, etc., in each; then a general arrangement of plants may follow. The kitchen, if light and warm and having more moisture in the air than any other room in the house, would be a good place for such plants as coleus, crotons, palms, etc. A cooler room would do for geraniums, stocks and the like. A warmer room with less moisture would suit pandanus, abutilons, some varieties of palms, especially if the lack of moisture in the air was supplied by frequent spraying in the case of the latter, and so on over the whole list much can be done. What I have said is no doubt more suggestive than otherwise, but if it will lead any interested persons to study out results for themselves along these lines, then I shall feel rewarded for my trouble in preparing this paper.

Considerable discussion followed, by which much information was elicited regarding how to water plants, how often to apply it, best fertilizers to use for house plants, proper temperature for coleus, geraniums, etc.

The President then called upon Mr. L. Woolverton, Secretary of the Ontario Fruit Growers' Association to give an address on Small Fruit Growing. The following are some of the points made by Mr. Woolverton in his address:

SMALL FRUITS FOR PROFIT.

The man who is favorably situated, and has the right kind of soil, and who himself is the right sort of a man, may devote his attention more or less to small fruits with a reasonable prospect of making a fair profit. To be favorably situated, he must either be within driving distance of a market for his fruit, or near an express office from which his fruit may be forwarded to a city at a reasonable rate; to have the right kind of soil, he must have land that is not too heavy to be easily cultivated at all seasons, and not so light as sand as to be too readily affected by drought; and to be the right sort of a man, he needs to have some knowledge of fruit culture, much patient perseverance, and a disposition to pay close attention to many little and apparently unimportant details. Mr. J. H. Hale, an authority of high standing in Connecticut, gives the following as the requisites to success in small fruit culture: 1. A love of fruits for their own sake, and pleasure in their culture. 2. A soil fairly well adapted. 3. Markets within easy reach. 4. A supply of extra laborers near enough to be promptly available in emergencies. 5. Plant no more than can be thoroughly cultivated and profitably marketed.

Upon such circumstances I can encourage any one so disposed, to enter upon this industry. But, just here, I wish to sound a note of warning, and to say that not all the glowing accounts of the profits of fruit culture are to be swallowed whole. It has been to the interest of the nurserymen to laud the business, to exaggerate the profits of it until many are tempted to leave good situations to engage in it, who are utterly ignorant of it, and who are doomed to disappointment. Like any other line, the profits only come as the reward of the most patient industry.

The subject of small fruits for profit is too large to be treated in one paper; it needs a series of papers in order to deal with it in a profitable manner. I shall therefore in this one confine myself principally to the

Strawberry,

leaving the others for successive papers. One of the most important essentials for success in the selection of varieties. And in this the amateur is almost bewildered with the multitude, each of which has been boomed as the one beyond all the others in value.

It may be interesting here to notice that all our prominent varieties are natives of America, and improved from that known botanically as Fragaria Virginiana. A little while ago, the popular foreign varieties, such as Jucunda, and Triomphe de Gand had their commenders, but of late, since the introduction of such fine large varieties as Sharpless, Bubach, Haverland, etc., and others, they have been thrown aside, because so much less productive. My list of varieties for profit is soon given. I would omit the old Crescent. True, it is one of the earliest and most productive of all strawberries, but it is soft and poor in quality.

The Wilson seems likely to give place to some of the newer varieties for main crop, but many still prize its firm flesh and tart flavor, especially for canning for home use. Firmer than the Crescent, it is better suited to ship to distant markets, and it never disappoints the planter as a market berry unless enfeebled by rust, which lately is its chief fault.

The Sharpless for large berries and top prices is indispensable, but it is a poor shipper, and unless used soon after picking is almost inedible. It is best cultivated in very narrow rows or else in hill culture.

Among the newer berries which have been tested, we mention the Bubach as one of the most promising; indeed it is likely to displace the Sharpless, being about as large, more regular in shape and far more productive. At least this was my experience with it last season.

The plant is a strong grower, with large, healthy foliage, and very productive; succeeds on light or heavy soil. The blossom is perfect; berry large, roundish conical, bright scarlet, moderately firm, fair quality; season, early to medium.

The Williams, a variety which originated near you, in a place called Cainsville, is quite a success with me in Grimsby; indeed, I have gathered more fruit from it than from any other variety. It is also very firm and therefore an excellent shipper. It is too well known to you to need description.

The Saunders, one of John Little's seedlings, is in my opinion very valuable. The plant is a good grower and a heavy bearer; blossom, staminate; fruit, large, conical, dark glossy red; quality, good; season, medium.

The Haverland is a very productive variety, and the plant withstands drouth well; blossom, pistillate; fruit, medium to large, but rather soft, light red; season, early. This variety is a favorite with me on account of its shape, size, and color.

Warfield is another very productive plant, though rather small; berry, firm, dark glossy red; some say it is larger than the Wilson, but with me it averages about the same.

Another berry, which the originator, Mr. John Little, has done me the honor of calling the Woolverton, impressed me very favorably, but I have not tested it yet long enough to say much about it.

The Enhance is much commended by some experimenters, and the plants are strong, healthy growers; berries, large like Sharpless, but firmer; season, medium.

You need not invest much in plants. You should learn some of the secrets of the nursery—enough at least to propagate all kinds of small fruits for yourself. Buy a dozen of any new kind of strawberry plant and very soon you will have all you want for yourself.

Fertilization of the Blossoms.

The strawberry grower who is ignorant of the sexuality of the plants he is using, often makes a serious mistake in planting. Many varieties, such as the Wilson, Downing, May King, Captain Jack and Sharpless, have perfect flowers—that is, the stamens and the pistils are both fully developed. Everyone nowadays knows that unless the pollen dust from the stamens fertilizes the pistils, no seeds will be produced, and little or no fruit, but in the case of the perfect or hermaphrodite varieties above mentioned, this is safely provided by their own flowers.

There are other varieties, however, such as Crescent, Bubach, Jewell, Manchester, which have imperfect blossoms. They are pistillate—that is, they have pistils only, and the stamens are aborted, or so imperfectly developed as to supply no pollen. Such varieties need to be planted in the vicinity of some variety from which the wind and the bees will bring the pollen dust to their pistils, and for this purpose it will suffice if every third or fourth row is planted with a hermaphrodite. George R. Knapp, a celebrated strawberry grower, of Greenfield, Mass., speaks very highly of the Sharpless as a variety for this purpose, and says he has found the Crescent unequalled when every third or fourth row is planted with the Sharpless; while for a medium to late kind, he has had great success with the Manchester fertilized by Sharpless, and declares that in this way the size of the former is very materially increased.

Choice and Preparation of Soil.

A deep, rich sandy loam, not too light, is best for strawberries. Generally speaking, such land as would produce a good crop of corn is the kind of land which may be depended upon for a successful plantation. For one or two years previous the ground should be thoroughly worked up, and then, before setting, thoroughly manured and prepared for planting by deep plowing and pulverizing. It may then be marked out with a corn planter in rows three feet apart.

Planting.

Great care should be taken to shade the rows from the rays of the sun. I use a basket covered with a damp cloth for carrying the plants while planting. The quickest method I have ever tried of setting the plants is to open the earth with a slanting cut of the spade, while a boy spreads out the roots of the plant, and places them in the opening. The spade is then withdrawn, and the earth, falling back, is firmed with the foot, and thus the plant is securely and well planted. Planters differ somewhat as to the best distance apart in the rows, some advocating 12, some 18 inches; but unless there is reason for economizing plants, the lesser distance is to be preferred. The best time for planting is as early in the spring as the ground is in good condition, in order that the plants may make as much growth as possible the first season, and be prepared to yield a full crop the following season.

Manure.

In this lies concealed one great secret of the greatest success in profitable strawberry culture, as well as in most departments of practical horticulture. We are often astonished at the immense yield of a small garden plot, and we say, "If a quarter of an acre will yield 1,500 quarts of fine berries, an acre would yield four times as many, or about 6,000 quarts." We plant the acre, with the expectation of coining money, and lo! we get only about 2,000 quarts from the whole acre. What is the trouble? Why, we have put the labor, the manure and the cultivation, on the acre that we before put on the quarter, and the failure is the natural result. Listen to what Mr. P. Curry, a market gardener in Keokuk Co., Iowa, says in the *Prairie Farmer* on this point: "In your issue of June 7th a writer reports a big strawberry yield of 5,000 quarts from one acre. I will give a report which discounts his. I have a patch, 10 by 13 rods square, of Crescent Seedlings fertilized with Captain Jack, from which we picked in 1886 5,060 quarts, and in 1887 5,100 quarts. This is exclusive of all used at home and given away. The secret of the large crop is, deep ploughing and heavy manuring and mulching."

No doubt that barnyard manure is one of the best fertilizers for the strawberry, if it can be had in sufficient quantity. The late Mr. E. P. Roe was an enthusiast in small fruit culture, and he advised it in preference to any other manure, recommending a dressing as heavy as sixty tons to the acre. At one dollar per load this would be rather an expensive operation, but with him it was the secret of his success. Mr. J. H. Hale, of Massachusetts, who is a good authority on small fruits, recommends fertilizers containing a large proportion of phosphoric acid and potash, but lacking in nitrogen, claiming that this latter element tends to the over-production of foliage. He uses ground bone ashes and wood ashes in the proportion of 1,500 pounds of the bone and 500 pounds of muriate of potash, or its equivalent in wood ashes, to an acre. Another noted strawberry grower (Mr. M. B. Faxon, of the same State) says he always applies stable manure in the fall to his beds, and a little phosphate in the spring, the latter tending greatly to increase the size and quantity of the berries.

Cultivation

should proceed the whole season through. Many neglect cultivation before fruiting season, on the plea that it will disturb the plants, lessen the yield, and cause the fruit to become dirty. But worse ills than these are likely to overtake the man who neglects cultivation. His plantation is lost in weeds and grass, his berries dry up in time of drouth, and are as small as his profits. I have tried watering such a plantation at great expense, by drawing barrels of water and pumping the water over the ground, and by digging a well in the strawberry patch; but a day's hot sunshine, and the ground was as dry as ever. My experience is that constant cultivation in time of drouth is an excellent mode of irrigating plantations in Canada.

If some system of irrigation could be planned by which a constant supply of water would be furnished the strawberry plantation in time of drouth, it would, no doubt, bring

the planter the highest success, giving him a full crop of the largest fruit. In California, where the land would be a desert without it, irrigation is necessary every summer, and is worked in a gigantic scale, each grower paying for his supply of water according to the amount he uses, and the results are marvellous. Plains that were before destitute of vegetation become clothed with beauty, and yield their owners immense crops of fine fruit.

With us irrigation is not an absolute necessity, and hence is neglected; but we believe, if some simple and inexpensive method could be adopted, that the results would be most gratifying. We referred in a late number of the *Canadian Horticulturist* to a method of tile irrigation which looks practicable and worthy of a trial. It is described as follows: By means of the farm windmill, a tank reservoir may easily be filled, and thus, the necessary water and pressure for flooding small areas, may be obtained. The water is distributed by means of common drain tile, using sizes from two to four inches in diameter; the larger for the main or distributing tile and the smaller for branches. The tiles are laid at a depth of about a foot or fifteen inches below the surface, the excavations being made by a plow without much expense, and the lines of tiles are laid about ten feet apart. When the water is turned on into the standpipe, it will fill the pipes to their extremities, which, of course, are closed, and a portion of the water, constantly escaping by the joints, will work its way by capillary attraction toward the surface of the soil. One acre is about the extent which may be worked under one system of pipes and machinery.

It is important that cultivation should continue throughout the season. Time and labor thus spent will return four-fold in yield of fruit, and size of berry the coming season, for it is at this time that the fruit buds are being formed for the next year. It is a great advantage to keep the rows narrow both for ease in cultivtion, and for general thrift of the plants. The wide matted row may do well for a single season, but then it becomes crowded and grass grown, and in time of drouth suffers extremely; and about the second year it needs plowing up. But if the rows are kept narrow, with not more than two or three plants abreast, all will receive the benefit of the hoe and of the cultivator, they will keep up a thrifty growth, and may be kept in bearing for several successive seasons.

Winter Protection

is of the utmost importance. It grieves one to see a beautiful bed of strawberry vines exposed to the killing influence of the alternate freezing nights and thawing days of March and April, when a little timely effort would have saved them. Straw, cornstalks, coarse manure, evergreen boughs, etc., may be used and need not be applied until the ground is frozen, as the purpose is not to keep away the frost but to prevent the frequent thawings and freezings.

Picking

in a proper manner is more important than many suppose. Careful hands who will not mash the fruit, but gather by nipping off a part of the stem with the thumb and forefinger deserve better pay than those who are careless. This work should not be done if avoidable when the fruit is wet, as it will not look or keep as well as when picked dry. The cool of the afternoon is about the best time, for then the fruit is dry and not overheated by the burning rays of the sun.

In some plantations it is customary to give each picker a carrier which holds six small baskets marked with his name or corresponding number. He must return all baskets to the packing shed, full or empty, and receive an account ticket. These are of rough paper, with name and number of picker and with figures for quarts, which are punched to show how many are delivered. At night these are taken up and the number of quarts marked on a weekly ticket, which contains in addition to name and number of picker, six columns for record of berries picked each day, one for sum total and one for cash paid Saturday evening. These are taken up when paid and filled.

My own plan is to give out the patch in sections for the season to competent persons, who will use their own children or employ others and thus relieve me of oversight, or of the need of an overseer. Many a woman with a family of children will gladly take a contract for a certain number of rows for the season, and I have never had the work done so well and with so much comfort as in this way. Strawberry picking to be contracted in this way at 1½ cents per quart; currants, gooseberries and blackberries at 1 cent, and raspberries at 2 cents, and be well and faithfully done.

The Package

which I have used for some years is the 24 quart basket crate, which is sold with the fruit. The cost is only 16 cents per crate and baskets, or ⅔ cent per quart, and it has always appeared to me that the express charges on the heavy wooden crate and the frequent loss of the same, is quite that much and not so convenient or attractive on the market. Latterly I have used a 16 quart crate costing 12 cents, which is very convenient to handle, and contains just the quantity of fruit which a small family wants to purchase at one time for canning or preserving. Indeed the time has come when large awkward packages are at a discount and tidy and convenient packages are most in demand.

When all is done, and done properly, the question remains, does it pay?

At 1 cent for picking, 1 cent for the package, 1 cent for express charges and the commission merchant, and 1 cent per quart toward paying expenses of cultivation and rent of land, we have 4 cents a quart as the minimum price which will cover all expenses, and the profit must be looked for in the number of cents over this which the crop averages, and the yield per acre.

Taking an average yield of 2000 quarts per acre, and an average price of 8 cents per quart, we have 2000 x 4 equalling $80 profit; but as we only get two crops in three years, we have only an average of say $50 per year net profit. But double the yield as it is possible to do, and you will more than double the profits.

Most farmers agree that there is positively no net profit in grain growing, and little in any agricultural line unless it be live stock. I wish to point out that money can be made in strawberry culture; not to give any extravagant ideas of the profits of it, for there is plenty of room for failure, but it is worth trying in favorable localities, and is as likely to be profitable as any other crop.

The Secretary of the Brant Horticultural Society then gave an address on methods of picking and marketing small fruits, which was followed by considerable discussion.

The next meeting of the Society will be held in Burford, some time in the month of February.

D. M. Lee, Secretary.

APPENDIX III.

CATALOGUE OF FRUITS—APPLES.

FOR USE OF JUDGES AT EXHIBITIONS.

EXPLANATORY NOTE.—In the plan of rating, all varieties are supposed to be perfect specimens: then the best varieties under each of three or four heads are rated at ten, and all the more or less inferior varieties by some figure less than ten. It frequently happens, however, even with the best varieties, that imperfect samples are exhibited. In such cases all values given in the Catalogue must be reduced one or more points each, for (1) lack of color, (2) undersize, (3) unevenness of size on plate, (4) wormy, scabby or illshapen specimens, (5) lack of stem or calyx, (6) polished fruits, i.e., having bloom wiped off, or (7) any other thing which tends to change the natural appearance of the fruit.

The column "Total Value" is for use when prizes are offered for fruits without designating the purpose for which such fruits may be required.

Name.	Season.	Quality.		Commercial value.		Total value.
		Dessert.	Cooking.	Home market.	Foreign market.	
Alexander	A	.....	9	9	10	28
American Golden Russet	W	9	8	8	9	34
American Summer Pearmain	S	3	1	2	.....	6
Arnold's Beauty	W	5	2	2	3	12
American Pippin	W	5	8	3	5	21
Adam's Pearmain	W	8	8	7	7	30
Autumn Strawberry	A	5	1	2	5	13
Bailey Sweet	W	2	8	1	3	14
Baldwin	W	2	5	7	8	22
Beauty of Kent	A	.....	8	8	7	23
Ben Davis	W	.....	1	8	9	19
Benoni	S	10	.....	1	.....	11
Belmont	W	3	6	4	6	19
Blenheim Pippin	W	6	7	9	10	32
Blue Pearmain	W	6	6	8	8	28
Bottle Greening	W	6	7	2	4	19
Bourassa	W	5	4	3	6	18
Cabashea	W	2	7	8	9	26
Canada Baldwin	W	6	8	8	9	31
Canada Reinette	W	4	8	5	7	24
Cayuga Red Streak	A	2	8	7	8	25
Chenango Strawberry	A	8	3	7	.....	18
Colvert	A	1	9	7	8	25
Cornish Gillyflower	W	1	.....	1	2	4
Cox's Orange Pippin	A	9	3	7	10	29
Cranberry Pippin	W	7	8	8	8	31
Cellini	W	2	8	7	6	23
Domine	W	5	7	6	7	25
Drap d'Or	A	2	6	3	5	16
Detroit Black	A	.....	4	2	4	10
Duchess of Oldenburgh	S	2	10	10	10	32
Dyer	A	7	5	3	.....	.....
Early Harvest	S	9	3	9	.....	21
Early Joe	S	8	3	3	.....	14
Early Strawberry	S	8	2	7	.....	17
Edgar's Red Streak	W	5	7	7	8	27
Ella	W	2	4	3	5	14
Esopus Spitzenburg	W	9	7	9	10	35
Fallawater	W	7	8	8	9	32
Fall Jenetting	A	3	7	7	7	24
Fall Orange	A	4	7	6	8	20
Fall Pippin	A	6	8	7	7	28
Flushing Spitzenburg	W	6	9	9	9	33
Fameuse	A	9	5	9	8	31

NOTE.—In the first column the letter S denotes summer, A autumn and W winter.

CATALOGUE OF FRUITS.—APPLES.—*Continued.*

Name.	Season.	Quality.		Commercial value.		Total value.
		Dessert.	Cooking.	Home market.	Foreign market.	
Fall Queen (*See* Haas)						
Gloria Mundi	W		8	6	8	22
Golden Russet (English)	W	8	7	8	9	32
Golden Sweet	A	2	4	1		7
Grand Sultan	A	2	7	7		
Gravenstein	A	9	9	10	10	38
Green Newton Pippin	W	9	4	6	8	27
Grimes' Golden	W	9	2	6	7	24
Haas (*See* Fall Queen)	A	5	7	7	6	25
Hawley	S	6	5	5		16
Hawthornden	A	2	8	7	7	24
Holland Pippin	A	6	8	7	7	28
Hubbardston Nonsuch	W	7	8	8	8	31
Hurlbut	W	5	5	4	6	20
Irish Peach	S					
Jeffries	A	7	6	6	7	26
Jersey Sweeting	A	1	3	1		5
Jonathan	W	9	7	7	8	31
Kentish Fillbasket	A		8	8	8	24
Keswick Codlin	A	1	9	6	7	23
King of Tompkins County	W	8	10	10	10	38
Lady	W	9		1	9	19
Late Strawberry	A	7	5	5	7	24
Lawyer	W	5	7	4	5	21
Lord Suffield	A	3	8	6	7	24
Lord Duncan	A	2	9	7	6	24
London Pippin	W		8			
Lowell	A	5	7	4		
Lord Burleigh	A	2	9	5		16
La Rue	W	1	9	10	5	25
Maiden's Blush	A	3	7	7	8	25
Mann	W	4	7	6	8	25
Magog Red Streak	W	3	7	5	7	22
McIntosh Red	W	6	7	7	8	28
Melon	W	8	8	7	8	31
Minister	A	4	6	6	5	21
Monmouth Pippin	W	6	8	6	7	27
Mother	A	8	7	6	6	27
Munson Sweet	A	1	3	2		6
Newton Spitzenburg	A	7	8	6	7	28
Northern Spy	W	8	10	10	10	38
Newton Pippin	W	9	9	7	10	35
Ontario	W	9	10	10	10	39
Peck's Pleasant	W	7	7	6	8	28
Pennock	W	5	7	7	8	27
Pewaukee	W	4	8	8	8	28
Peach	A					
Phœnix	W	4	7	7	8	26
Pomme Grise	W	9		5	7	21
Pomme Grise d'Or	W	10		6	8	24
Porter	A	5	4	5	3	17
Priestly	W	4	5	6	7	22
Primate	S	7	6	6		19
Prenzea	A	9	9	5	5	28
Princess Louise	W	10	7	8	8	33
Pumpkin Sweet	A		4	1		5
Pumpkin Russet	A	1	6	4	5	16
Pomme Royale (*See* Dyer)						
Rambo	A	5	1	2	5	13
Rawles Janet	W	4	5	3	5	17
Red Astrachan	S	5	7	8		20
Red Belle-fleur	A	2	4	2		8
Red Canada	W	6	6	7	8	27
Red Catnead	A	6	8	7	7	28
Red Russet	W	5	6	7	7	25
Red Bietigheimer	A					
Rhode Island Greening	W	8	10	8	8	34

CATALOGUE OF FRUITS.—APPLES.—*Continued.*

Name.	Season.	Quality.		Commercial value.		Total value.
		Dessert.	Cooking.	Home market.	Foreign market.	
Ribston Pippin	W	10	8	8	10	36
Roxbury Russet	W	6	8	8	9	31
Scarlet Pearmain	A	5	6	5	6	22
Shiawassee Beauty	A	7	6	6	...	19
Smith's Cider	W	1	4	...	1	6
Smoke-house	A	3	6	4	6	19
Sops of Wine	S	2	5	2	...	9
St. Lawrence	A	7	8	8	8	31
Stump	A	5	6	5	...	16
Summer Rose	S	6	6	4	...	16
Swaar	W	7	2	1	4	14
Swaize Pomme Grise (*See* Pomme Grise d'Or)						
Stark	W	2	2	7	8	19
Snow (*See* Fameuse)						
Talman Sweet		2	7	5	6	20
Tetofsky	W	1	5	1	...	7
Trenton	S	10	5	9	9	33
Twenty Ounce (*See* Cayuga Red Streak)	A					
Vadevere	A	6	5	4	6	21
Wagener	W	8	7	6	7	28
Wallbridge (*See* Edgar's Red Streak)						
Wealthy	W	8	6	9	9	32
Westfield-Seek no-Further	W	7	7	7	8	29
White Astracan	S	1	2	1	...	4
William's Favorite	W	5	7	5	6	23
Wine Sap	W	7	...	1	3	11
Wine	W	7	7	8	8	30
Yellow Belle-fleur	W	8	7	5	5	25
Yellow Transparent	S	6	7	6	...	19

GRAPES.

(This list is subject to revision each year.)

Varieties.	Color.	Season.	Quality for table.	Shipping value.	Market value.	Total.
Agawam (Rog. 15)	R	L	8	10	9	27
Allen's Hybrid	W	M	5	2	4	11
Amber Queen	R	M	5	4	4	13
Amber	R	L	4	3	2	8
Amma (Rog. 39)	B	M	8	10	6	24
Ann Arbor	W	E	3	2	3	8
August Giant	B	M	4	1	3	5
Augusta	B	M	6	...	...	...
Barry (Rog. 43)	B	M	5	9	6	20
Brighton	R	E	6	6	8	23
Black Eagle	B	L	4	3	2	6
Black Pearl	B	L	4	3	2	6
Barnett	B	M	6	6	4	14
Canada	B	M	2	3	1	6
Catawba	R	L	9	8	8	25
Champion	B	E	7	3	2	12

List of Abbreviations.—R red, W white, B black, L late, E early, and M medium.

CATALOGUE OF FRUITS.—GRAPES.—*Continued.*

Varieties.	Color.	Season.	Quality for table.	Ship'g value.	Market value.	Total.
Clinton	B	L	....	5	2	7
Concord	B	M	7	6	8	21
Cottage	B	E	5	5	4	14
Creveling	B	E	6	6	3	15
Croton	W	E	4	3	3	10
Cynthiana	B	L	1	2	1	4
Courtland	B	E	2	5	5	12
Delaware	R	E	10	7	9	26
Diana	R	L	6	8	7	21
Duchess	W	L	1	6	7	14
Dracut Amber	R	E	1	6	7	14
Eaton	B	M	7	5	3	15
Early Dawn	B	M	6	4	4	14
Elvira	W	L	1	2	1	4
Empire State	W	L	3	4	4	11
Early Ohio	B	E	3	6	5	14
Eumelon	B	E	6	5	4	15
Eldorado	W	M	7	5	2	14
Etta	W	L	2	4	3	9
Early Victor	B	E	5	4	3	12
Essex (Rog. 41)	B	L	3	7	6	16
Faith	W	E	2	2	3	7
Florence	B	E	2	2	3	7
Goethe (Rog. 1)	R	L	8	5	5	18
Gaertner (Rog. 14)	R	M	8	6	6	20
Hartford	B	E	3	5	6	14
Herbert (Rog. 14)	B	M	6	8	7	21
Highland	B	L	3	4	2	9
Hayes	W	M	5	2	3	10
Herbemont	B	L	1	2	3	6
Iona	R	L	8	7	6	21
Isabella	B	L	3	7	6	16
Ives	B	E	2	5	5	12
Israella	B	L	3	6	4	13
Janesville	B	E	2	3	3	8
Jessica	W	E	5	5	5	15
Jefferson	R	L	6	4	5	15
Jewell	B	M	4	4	2	10
Lady	W	E	7	3	5	15
Lady Washington	W	L	3	5	3	11
Lindley (Rog. 9)	R	E	10	9	9	28
Massasoit (Rog. 3)	R	E	6	4	5	15
Martha	W	M	6	5	3	14
Merrimac (Rog. 49)	B	L	7	9	6	22
Moore's Early	B	E	7	6	9	22
Moyer	R	E	7	7	9	23
Mills	B	M	6	7	3	16
Moore's Diamond	W	E	7	7	7	21
Marion	B	L	1	4	2	7
Niagara	W	M	8	5	9	22
Noah	W	L	1	5	3	9
Norton	B	L	1	5	2	8
Northern Muscadine	R	M	2	6	6	14
Oneida	R	M	3	2	4	9
Ontario	B	M	2	4	4	10
Othello (Arnold's No. 1)	B	L	2	3	2	7
Perkins	R	E	2	6	6	14
Pocklington	W	M	6	6	6	18
Prentiss	W	L	5	7	4	16
Poughkeepsie Red	W	E	6	6	7	19
Pearl	R	L	1	2	1	4
Rebecca	W	M	8	4	4	16
Requa (Rog. 28)	R	M	7	8	7	22
Rentz	B	M	1	2	2	25
Rockingham	B	M	7	6	8	21
Roger No. 17	B	M	6	6	6	18
Roger No. 32	R	L	3	7	6	16

CATALOGUE OF FRUITS.—GRAPES.—*Continued.*

Varieties.	Color.	Season.	Quality for table.	Ship'g value.	Market value.	Total.
Roger No. 33	B	M	5	7	6	18
Roger No. 11	B	M	7	8	7	22
Salem (Roger 22)	R	M	8	8	8	24
Sanasqua	B	L	5	5	5	15
Secretary	B	M	3	4	3	10
Telegraph	B	M	3	5	3	11
Transparent	W	L	1	4	1	6
Triumph	W	L	1	5	1	7
Taylor	W	L	1	4	2	7
Ulster Prolific	R	M	4	5	5	14
Union Village (No. Ontario)						
Vergennes	R	L	6	10	8	24
Victor (Sie Early Victor)						
Walter	R	M	6	7	7	20
Worden	B	E	9	4	8	21
White Ann Arbor	W	E	4	4	4	12
Wilder (Reg. 4)	B	M	8	9	8	25
Wyoming Red	R	E	5	6	7	18
Woodruff Red	R	M	4	6	5	15

DISTRICT FRUIT LIST.—APPLES.

Showing the varieties considered most desirable for planting in the various Agricultural Districts in Ontario.

DISTRICT No. 1.—Stormont, Dundas, Glengarry, Prescott and Cornwall.

Summer.—Yellow Transparent, Duchess of Oldenburgh.
Autumn.—Alexander, Fameuse, Gideon, St. Lawrence.
Winter.—LaRue, Pewaukee, Golden Russet, Ben Davis, Talman Sweet.

DISTRICT No. 2.—Lanark, Renfrew, City of Ottawa, Carleton and Russell.

Summer.—Yellow Transparent, Duchess of Oldenburgh.
Autumn.—Alexander, Montreal Peach, Wealthy and Haas.
Winter.—Pewaukee, Golden Russet, Scott's Winter, Talman Sweet and Edgar's Red Streak.

DISTRICT No. 3.—Frontenac, City of Kingston, Leeds, Grenville and Brockville.

Summer.—Yellow Transparent, Duchess of Oldenburgh and Red Astrachan.
Autumn.—Alexander, Wealthy and St. Lawrence.
Winter.—Golden Russet, Pewaukee, LaRue, Ben Davis and Red Canada.

DISTRICT No. 4.—Hastings, Prince Edward, Lennox and Addington.

Summer.—Yellow Transparent and Duchess of Oldenburgh.
Autumn.—Alexander, Trenton, Gravenstein and Wealthy.
Winter.—Ontario, Hubbardston's Nonsuch, Pewaukee, Ben Davis and Cranberry Pippin.

DISTRICT No. 5.—Durham, Northumberland, Peterborough, Victoria and Haliburton.

Summer.—Yellow Transparent and Duchess of Oldenburgh.
Autumn.—Alexander, Colvert, St. Lawrence and Gravenstein.
Winter.—Ontario, Hubbardston's Nonsuch, Pewaukee, Ben Davis and Ribstone Pippin.

DISTRICT No. 6.—York, Ontario, Peel, Cardwell and City of Toronto.

Summer.—Yellow Transparent and Duchess of Oldenburgh.
Autumn.—Alexander, Gravenstein, Red Bietigheimer and Wealthy.
Winter.—Golden Russet, Pewaukee, Ontario, Ben Davis and Hubbardston's Nonsuch.

District No. 7.—Wellington, Waterloo, Wentworth, Halton, Dufferin and City of Hamilton.

Summer.—Yellow Transparent, Red Astrachan and Duchess of Oldenburgh.
Autumn.—Gravenstein, Colvert and Wealthy.
Winter.—Golden Russet, Ontario, Blenheim Pippin, Baldwin and Cranberry Pippin.

District No. 8.—Lincoln, Welland, Haldimand and Monck.

Summer.—Duchess of Oldenburgh and Red Astrachan.
Autumn.—Gravenstein, Ribston Pippin and Wealthy.
Winter.—Blenheim Pippin, Ontario, Princess Louise, Golden Russet and Cranberry Pippin.

District No. 9.—Elgin, Essex, Oxford and Norfolk.

Summer.—Duchess of Oldenburgh and Red Astrachan.
Autumn.—Gravenstein, Twenty Ounce and Fall Pippin.
Winter.—Blenheim, Pippin, Ontario, Baldwin, R. I. Greening and Golden Russet.

District No. 10.—Huron, Bruce and Grey.

Summer.—Yellow Transparent and Duchess of Oldenburgh.
Autumn.—Gravenstein, Wealthy and Colvert.
Winter.—Pewaukee, Ontario, Baldwin, Hubbardston's Nonsuch and Cranberry Pippin.

District No. 11.—Middlesex, Perth and City of London.

Summer.—Duchess of Oldenburgh and Yellow Transparent.
Autumn.—Gravenstein, Colvert, Alexander and Fall Pippin.
Winter.—Golden Russet, Ribston Pippin, Ontario, Hubbardston's Nonsuch and Cranberry Pippin.

District No. 12.—Essex, Kent and Lambton.

Summer.—Yellow Transparent and Duchess of Oldenburgh.
Autumn.—Gravenstein, Chenango, Strawberry, Wealthy and Lowell.
Winter.—Ontario, Blenheim Pippin, Baldwin, R. I. Greening and Golden Russet.

District No. 13.—Algoma, Simcoe, Muskoka and Parry Sound.

Summer.—Duchess of Oldenburgh and Yellow Transparent.
Autumn.—Alexander, Colvert, Red Beitigheimer and St. Lawrence.
Winter.—Pewaukee, Golden Russet, Scott's Winter, LaRue and Wealthy.

DISTRICT FRUIT LIST.—GRAPES.

District No. 1 :

Black.—Champion, Worden, Early Victor, Moore's Early.
Red.—Delaware, Lindley Moyer, Wyoming Red.
White.—Eldorado, Niagara, Jessica, Vergennes.

District No. 2 :

Black.—Barry, Rog. 17, Herbert, Moore's Early, Worden.
Red.—Delaware, Gartner, Norwood, Vergennes, Lindley.
White.—Duchess, Kensington, Moore's Diamond, Lady.

District No. 3 :

Black.—Champion, Moore's Early, Worden, Hartford.
Red.—Lindley, Brighton, Delaware.
White.—Moore's Diamond, Jessica, Eldorado.

District No. 4 :

Black.—Worden, Moore's Early, Early Victor.
Red.—Wyoming Red, Delaware, Moyer.
White.—Jessica, Moore's Diamond, Niagara.

District No. 5 :

Black.—Champion, Worden, Wilder.
Red.—Brighton, Delaware, Salem, Lindley, Agawam.
White.—Niagara.

District No. 6 :

Black.—Worden, Moore's Early, Champion.
Red.—Brighton, Lindley, Delaware, Wyoming Red.
White.—Jessica, Niagara.

District No. 7 :

Black.—Concord, Worden, Rog. 4—44, Moore's Early.
Red.—Rog. 9—15, Vergennes, Delaware, Brighton.
White.—Niagara, Moore's Diamond.

North Lake District :

Black.—Champion, Worden, Rog. 4, Moore's Early.
Red.—Wyoming Red, Salem, Rog. 9, Delaware, Brighton.
White.—Jessica, Lady, Niagara.

District No. 8 :

Black.—Concord, Worden, Rog. 44, Moore's Early.
Red.—Rog. 9—15, Vergennes, Delaware, Brighton.
White.—Niagara, Moore's Diamond, Pocklington.

District No. 9 :

Black.—Worden, Concord, Rog. 4—44, Moore's Early.
Red.—Delaware, Lindley, Agawam, Brighton.
White.—Niagara, Pocklington.

District No. 10 :

Black.—Concord, Moore's Early, Worden.
Red.—Brighton, Delaware, Lindley.
White.—Niagara, Lady.

Lake Shore Division :

Black.—Concord, Worden, Moore's Early, Barry.
Red.—Agawam, Brighton, Lindley.
White.—Niagara, Lady.

District No. 11 :

Black.—Concord, Worden, Rog. 19, Rog. 4.
Red.—Rog. 9—15, Brighton, Delaware.
White.—Niagara, Moore's Diamond, Jessica.

District No. 12 :

Black.—Concord, Worden, Moore's Early, Hartford.
Red.—Delaware, Walter, Rog. 15—22, Brighton.
White.—Niagara, Prentiss, Lady.

District No. 13 :

Black.—Worden, Moore's Early, Champion.
Red.—Delaware, Lindley, Wyoming Red.
White.—Jessica, Moore's Diamond, Lady.

In compiling the foregoing Grape Lists we have consulted the Directors, as well as the leading fruit-growers throughout the several Districts. We have also tried to frame the lists so as to advise the planting of such varieties as bear the highest general points for each District for hardiness, productiveness, etc., shipping quality of fruit, and commercial values.

G. W. Clinе, *Chairman of Committee.*

PEARS.

Dr. BEADLE, Chairman of the Committee on the revision of the Pear Catalogue, presented the following Report at the annual meeting at Peterborough, and it was adopted.

This rating is solely for the use of Judges at Exhibitions, and not intended to be in any sense a guide for planters. In the rating here given the specimens of the several varieties are supposed to be perfect, free from the larvæ of the codling moth, from scab spots, curculio, indentations and all blemishes. Any specimens falling below perfection should be rated by the Judges at some figure less than the figure here given for perfect specimens, according to the degree of imperfection manifest in the specimen under consideration.

D. W. BEADLE,
GEO. W. CLINE,
W. H. DEMPSEY, } *Committee.*

——	Desert.	Home market.	Total.
Ananas d'Ete	4	6	10
Anjou	9	10	19
Bartlett	9	10	19
Belle Lucrative	7	6	13
Beurre Bosc	9	9	18
Beurre Giffard	8	9	17
Beurre Hardy	8	8	16
Beurre Gris d'Hiver	4	4	8
Beurre Superfine	6	5	11
Brandywine	7	8	15
Buffam	5	6	11
Clairgeau	5	9	14
Clapp's Favorite	7	8	15
Dana's Hovey	8	4	12
Dearborn	5	4	9
Dempsey	8	9	17
Diel	5	7	12
Doyenne Boussock	9	9	18
Doyenne d'Ete	5	4	9
Doyenne du Comice	8	7	15
Doyenne Grey	7	5	12
Doyenne White	8	7	15
Duchess d'Angouleme	7	8	15
Flemish Beauty	8	8	16
Frederick Clapp	..	..	..
Glout Morceau	6	5	11
Goodale	8	8	16
Howell	8	9	17
Jones	6	4	10
Josephine de Malines	10	6	16
Kieffer	4	6	10
Kirtland	4	4	8
Lawrence	8	8	16
Louise Bonne	6	8	14
Manning's Elizabeth	7	5	12
Mount Vernon	8	5	13
Osband's Summer	6	5	11
Petite Marguerite	5	4	9
Pres't. Drouard	7	8	15
Reeder	6	4	10
Seckel	10	5	15
Sheldon	10	9	19
Souvenir de Congres	4	6	10
Swan's Orange	5	7	12
Tyson	8	6	14
Triumphe de Vienne	8	8	16
Vicar	3	4	7
Winter Nelis	8	8	16

APPENDIX IV.

ONTARIO'S FRUIT EXHIBIT AT CHICAGO.

A list of varieties of fruit from the Province of Ontario on exhibition at the World's Columbian Exposition in Chicago in 1893; prepared by the Secretary, who was also Dominion Superintendent of Horticulture.

Apples.

Alexander.
Algoma Seedling.
American Golden Russet.
American Pippin.
Autumn Strawberry.

Baldwin.
Beall.
Beauty of Kent.
Bellefleur.
Bell Russet.
Ben Davis.
Benoni.
Black Apple.
Black Detroit.
Black Gilliflower.
Blenheim Orange.
Bonum.
Borsdorfer.
Bowman's Sweet.
Brockville Beauty.

Calashea.
Canada Baldwin.
Canada Red.
Cayuga Red Streak.
Chesterton Russet.
Chenango.
Clapperton's Nonsuch.
Colvert.
Cooper's Market.
Cornish Gillyflower.
Cranberry Pippin.

Duchess of Oldenburg.
Dutch Mignonne.

Early Joe.
Early Strawberry.
English Pippin.
English Russet.
Esopus Spitzenburg.

Fallawater.
Fall Jenetting.
Fameuse.
Flushing Spitzenburg.
Frontenac Red.

General Grant Crab.
Gideon.
Gloria Mundi.
Golden Pippin.
Golden Sweet.
Gravenstein.
Greening.
Grimes Golden.

Haas.
Hardestine's Pippin.
Hawley.
Hawthornden.
Haly.
Holland Pippin.
Hubbardston.
Hyslop Crab.

Ironhead.

Jersey Sweet.
Jonathan.

Kentish Fill-Basket.
Keswick Codling.
King.

Ladies' Sweet.
Lady.
LaRue.
Leeds.
Lowell.

Maiden's Blush.
Marengo Crab.
Michigan Red.
McIntosh Red.
McLean.
Mother.

Naigle's Winter.
Newton Pippin.
Noble's Vandevere.
Nonpareil.
Northern Spy.

Ontario.
Ortley.

Peach.
Peck's Pleasant.
Pewaukee.
Phœnix.
Pomme Grise.
Porter.
Pound Sweet.
Primate.
Prince Albert.
Princess Louise.

Rambo.
Red Astrachan.
Red Calville.
Red Pearmain.
Red Russet.
Ribston Pippin.
River.
Roxbury Russet.
Russian No. 1.
Russian No. 3.
Russian No. 4.
Russian No. 7.
Russian No. 8.
Russian No. 9.
Russian No. 10.
Russian No. 11.

APPLES.—*Continued.*

Russian No. 315,
Russian A,
Russian B,
Russian Y,
Russian Seedling,

Seek No Farther,
Solard,
Spotted Pippin,
Steele's Red Winter,
St. Lawrence,
Stott's Russet,
Striped Gilliflower,
Stump,
Sutton Beauty,
Swaar,
Swazie Pomme Grise,
Sweet Bough,

Tetofsky,
Tolman Sweet,
Transcendant Crab,
Trenton,
Twenty Ounce Pippin,

Vandevere,
Vanity Crab,
Vermont Pippin,
Wagener,
Wallbridge,
Wealthy,
Westfield Seek No Farther,
White Pippin,
Wilson's Seedling,
Winesap,
Winter St. Lawrence,
Winter Strawberry,

Yellow Bellefleur,
Yellow Newton Pippin,
Yellow Transparent.

PEARS.

Ananas d'Eté,
Angoulême,
Anjou,
Anne de Bretagne,

Bartlett,
Bartlett Pere,
Belle de Beaufort,
Belle Lucrative,
Bergamot,
Bessemianka,
Beurre Bosc,
Beurre Chaudry,
Beurre d'Eté,
Beurre Diel,
Beurre Giffard,
Beurre Grise d'Hiver,
Beurre Hardy,
Beurre Superfin,
Bloodgood,
Brockworth Park,
Budd,
Buffum,

Chambers,
Chaumontel,
Clairgeau,
Clapp's Favorite,

Dearborn's Seedling,
Dempsey,
Doyenne Boussock,
Doyenne de Comice,
Dr. Reeder,
Duchess,
Duke de Brabant,
Early Harvest,
Easter Beurre,
Elizabeth,

Fertility,
Flemish Beauty,

Gagovka,
Gansell's Bergamot,
Glout Morceau,
Goodale,
Grey Doyenne,

Honey Sweet,
Howell,

Josephine de Malines,

Kieffer,
Kingsessing,
Kirkland,

Lawrence,
Leconte,
Leslie,
Longstem,
Louise Bonne,
Louise Clapp,

Madeline,
Marguerite de Marillat,
Mignot,
Mikado,

Napoleon,
Onondaga,
Osband's Summer,
Oswego Beurre,

Paradise d'Automne,
Petite Marguerite,
Pound,
President Druard,

Reine de Verger,
Rostiezer,

Sapieganka,
Secretary Marechat,
Seckel,
Seedlings (several kinds),
Sheldon,
Souvenir de Congres,
Steven's Genesee,
Summer Belle,
Summer Bergamot,

Therese,
Tonkovietka,
Triomphe de Vienne,
Tyson,

Vernon,
Vicar,

White Doyenne,
Wilmot,
Windsor,
Winter Nelis.

PEACHES.

Alexander,
Amsden's June,

Beatrice,
Blood,
Bowslaugh's Late,

Centennial,
Chinese Cling,

Early Barnard,
Early Crawford,
Early St. John,
Early York,

Foster,

Garfield,
George the Fourth,

Hale's Early,
Haun's Golden,
High's Early Canada,
Honest John,

Ireland's Seedling,
Jacque's Rareripe,

Kensington,

Late Crawford,
Lemon Cling,
Longhurst,
Lord Palmerston,
Louise,

Morris White,
Mountain Rose,

Niagara,

Old Mixon,

Pine Apple,

Reeve's Favorite,

Salway,
Seedling Crawford,
Smith's Extra Late,
Smock,
Snow,
Steven's Rareripe,
Stump the World,

Wager,
Waterloo,
Wheatland,

Yellow Alberge,
Yellow Rareripe.

PLUMS.

Abundance,

Belgian Purple,
Bingham,
Bleeker's Gage,
Botan,
Bradshaw,
Burrow's Seedling,

Canada Orleans,
Caraduc,
Cline's No. 1.
Cline's No. 2.
Coe's Golden Drop,
Columbia,

Damson,
Dennison's Superb,
Diamond,
Duane's Purple,

Early Orleans,
Egg,
Empire,
English Damson,
Evelyn,

Fellemberg,

General Hand,
German Prune,
Glass,
Goderich,
Golden Gage,

Goliath,
Green Gage,
Gueii,

Hermosa,
Horse Seedling,
Huling's Superb,

Imperial Gage,

Jefferson,

Kingston,

Lady Grey,
Lawson's Golden Egg,
Lombard,
Lord Derby,

Magnum Bonum, Yellow,
Magnum Bonum, Red,
Miner,
McLaughlin,
Monroe Egg,
Moore's Arctic,
Moyer,

Native Blue,
Niagara,

Ogan,
Ontario Pride,
Orleans,
Owen Sound Beauty,

Peach,
Peter's Yellow Gage,
Pond's Seedling,
Prince Englebert,
Prince of Wales,
Prince's Yellow,
Purple Egg,

Quackenbos,

Red Gage,
Reine Claude,

Saunders,
Seedling of Smith's Orleans,
Shipper's Pride,
Shropshire Damson,
Simon's Plum,
Smith's Orleans,
Stewart,
St. Lawrence,
Sweetwater,

Vanity,
Victoria,

Washington,
Weaver,
Webster's Gage,
Wetherell's Seedling,
Wild Plum,

Yellow Egg,

Zena.

Cherries.

American Amber,
Black Eagle,
Black Heart,
Black Spanish,
Black Tartarian,
Coe's Transparent,
Early Purple,
Early Richmond,
Elkhorn,
Elton,
English Morello,
English Oxheart,
Governor Wood,
Great Biggareau,
Kentish,
Knight's Early Black,
Large Montmorency,
Mazzard,
Minnesota Ostheim,
Montmorency Ordinaire,
Monstreuse de Mezel,
Napolean Biggareau,
Native,
Ostheim,
Red Cluster,
Seedlings,
Vladimir,
Yellow Spanish.

Currants.

Black Champion,
Black Naples,
Black Seedlings,
Cherry,
Common Red,
Fay's,
Lee's Prolific,
Naples,
Native Black,
Raby Castle,
Red Dutch,
Saunders,
Versailles,
Victoria,
White Dutch,
White Grape,
White Imperial,
Wild.

Gooseberries.

Ashton (Improved),
Bloodhound,
Bottle Green,
Clayton,
Companion,
Crown Bob,
Downing.
Duke of Sutherland,
Golden,
Golden Ball,
Gold Finder,
Green River,
Gypsy Queen,
Houghton,
Industry,
Keepsake,
King of Trumps,
London,
Ocean Wave,
One of Them,
Pearl,
Providence,
Railway,
Ruby,
Smith's Improved,
Sulphur Queen,
Thumper,
Warrington,
White Eagle,
Whitesmith,
Winnow's King,
Winderful,
Yellow Champion,
Yorkshire Fillbasket.

Strawberries.

Advocate,
Auburn,
Atlantic,
Baron's Eclipse,
Barton,
Beder Wood,
Belmont,
Boyton,
Bubach,
Cameronian,
Captain Jack,
Cloud,
Crawford,
Crescent,
Cumberland,
Curtis,
Daisy,
Dominion,
Edgar Queen,
Enhance,

STRAWBERRIES.—*Continued.*

Eureka,
Farnsworth,
Gandy,
Governor Hoard,
Great Pacific,
Grenville,
Hatfield,
Haverland,
Ivanhoe,
Jessie,
Jumbo,
Lady Rusk,
Leader,
Little's 15,
London,
Louise,
Lovett,
Maggie,
Manchester,
May King,
Martha,
Miami,
Middlefield,
Michel's Early,
Monach,
Monmouth,
Mount Holyoke,
Mrs. Cleveland,
Mrs. Garfield,
Mystic,
Parker Earle,
Pearl,
Princess,
Sadie,
Saunders,
Seneca Queen,
Sharpless,
Shaw,
Townsend,
Victoria,
Walton,
Warfield,
Westbrook,
Williams,
Wilson,
Woodruff,
Woolverton,
Yale.

GRAPES.

Adirondac,
Alvah,
Amber Queen,
Augusta,
August Giant,
August Mammoth,
Bacchus,
Black Hamburg,
Black Pearl,
Black Prince,
Brighton,
Burnet,
Canada,
Canterbury,
Catawba,
Centennial,
Challenge,
Champion,
Clinton,
Concord,
Conqueror,
Cottage,
Creveling,
Delaware,
Diana,
Dracut Amber,
Duchess,
Early Dawn,
Early Victor,
Eaton,
Eldorado,
Elvira,
Empire State,
Etta,
Eumelan,
Faith,
Gaertner,
Geneva,
Hartford,
Iona,
Irving,
Isabella,
Israella,
Ives,
Janesville,
Jefferson,
Jessica,
Kensington,
Lady,
Lady Washington,
Marion,
Martha,
Mary,
Missouri Riesling,
Moore's Diamond,
Moore's Early,
Moyer,
Muscadine,
Niagara,
Noah,
Northern Light,
Norwood,
Othello,
Pearl,
Perkins,
Pocklington,
Potter,
Poughkeepsie,
Prentiss,
Red Chasselas,
Rentz,
Rogers 1 (Goethe),
Rogers 3 (Massasoit),
Rogers 4 (Wilder),
Rogers 9 (Lindley),
Rogers 13,
Rogers 15 (Agawam),
Rogers 17,
Rogers 19 (Merrimac),
Rogers 22 (Salem),
Rogers 24,
Rogers 28 (Requa),

GRAPES.—*Continued.*

Rogers 30,
Rogers 32,
Rogers 33,
Rogers 34,
Rogers 36,
Rogers 39 (Aminia),
Rogers 41 (Essex),
Rogers 43 (Barry),
Rogers 44 (Herbert),
Secretary,
Senasqua,
Taylor,
Telegraph,
To Kalon,
Transparent,
Triumph,
Ulster Prolific,
Vergennes,
Walter,
White Ann Arbor,
White Chasselas,
White Nice,
Woodruff,
Worden,
Wyoming Red.

RASPBERRIES.

Black Giant,
Brandywine,
Caroline,
Cole's Prolific,
Franconia,
Golden Queen,
Gregg,
Highland Hardy,
Marlboro',
Nemaha,
Philadelphia,
Shaffer,
Turner,
White Antwerp.

BLACKBERRIES.

Erie,
Kittatinny,
Lawton,
Lucretia Dewberry,
Snyder,
Taylor,
Western Triumph.

APPENDIX V.

EXPERIMENTAL FRUIT STATIONS FOR THE PROVINCE OF ONTARIO.

Subsequent to the meeting at Peterborough, the committee on experiment stations, consisting of Prof. John Craig of Ottawa, A. McNeill, of Windsor and W. W. Hilborn, of Leamington, prepared the following report, and submitted it to the directorate through the mail. The report was accepted, and the scheme adopted, a copy of which is herewith presented:

The exhibits of fruit made by Ontario at the World's Columbian Exposition gave to the world a truer conception of the possibilities and attainments of the Province. It also inspired the fruit-growers of the Province with a better appreciation of the capability of her soil and climate for the production of fruit—that "flower of commodities"—in its highest state of excellence. It has also emphasized in a general way the fact that each variety of fruit varies in respect to appearance and quality according to the soil and locality in which it is produced, and has a more or less area in which it reaches most nearly perfect development.

Our knowledge of the variations in habit of growth and quality of the fruit due to soil and climatic effects is vague and undefined, and data with regard to the relative success of varieties in different sections is lacking. The fruit interests of the Province suffer in consequence.

The Fruit-Growers' Association of Ontario has long recognized the advantage that would result from establishing a system of experiment stations, particularly designed to collect information of this character and to promote the fruit interests of this Province generally. That they are sincere in the matter is attested by the fact that a standing committee was appointed three years ago, whose duty it was to do everything in its power to bring the scheme to a successful completion. This committee has interviewed the Government annually, but thus far without any definite results.

The fruit-growers of Ontario fully appreciate the liberality with which they have been treated by the Provincial Government, but are assured that the good use made of their grant has more than justified the expenditure, in witness of which they point with pride to their journal of horticulture which has a circulation as wide as the continent, is well known in Europe, and is recognized as the official organ of the fruit growers of the Dominion.

In view of the large capital invested, and the annual revenue derived from the fruit industry of the Province, which, according to recent statistics, is second only in value to the hay crop, which takes the lead, your petitioners feel that they are justified in laying their desires before you with full assurance that they will receive at your hands that consideration which their importance deserves.

It is believed that the fruit interests of the Province cannot be served best by the establishment of a single experiment station, no matter where it might be located, and, further, that results more useful and more immediately available would be obtained by the establishment of a number of small and inexpensive trial experiment stations. These might be carried on in co-operation with the various fruit growers in different parts of the Province, who already are specialists, and have made a financial success of growing

one or more classes of fruit. For example, the services of a grape specialist, or a plum or peach grower might be secured with all the advantages accruing from knowledge gained by practical experience.

Organization.

The Board of Control shall consist of the President and the Horticulturist of the Ontario Agricultural College, and three members of the Fruit Growers' Association elected by the directors of that body, with the Secretary as *ex officio* member.

The line of work to be pursued by each station shall be decided upon by the Board of Control, and shall be submitted to the directors at the time of the annual meeting of the Fruit-Growers' Association for approval, together with a full report of the work of the year for incorporation in the Annual Report.

An Executive Board for each station, whose duty it will be to carry out the directions of the General Board of Control, shall consist, of the experimenter and the director of that district acting with the Secretary of the Fruit Growers Association.

All plants shall be purchased by the Secretary of the Fruit Growers' Association after consultation with the experimenter, subject to the approval of the Board of Control

Experimenters and their Duties.

Each experimenter should be a specialist and should have suitable soil for the cultivation of the particular class of fruit of his own choosing, which is mainly to be tested at the station of which he has charge. He shall be elected by vote of the Board of Control, subject to the approval of the Directors of the Fruit Growers' Association; and in case of incapacity or dereliction of duty shall be dismissed and his place filled by action of the same body.

The experimenters shall be members of the Fruit Growers' Association of Ontario.

The first duty of each shall consist of making an accurate and trustworthy report on all varieties of the particular fruit assigned which he has on trial up to date. To this list shall then be added all the desirable sorts of late introduction. These shall be obtained by the Secretary of the Fruit-Growers' Association in consultation with the other two members of the Executive Committee, subject to the approval of the Board of Control, and shall be properly planted, carefully recorded and labelled.

The Board of Control shall have power to arrange and manage all details in regard to perfecting the organization not otherwise provided for.

Collection and Diffusion of Information.

Brief reports shall be rendered to the editor of *The Canadian Horticulturist*, for publication in that journal, once in two months during the growing season; and a complete report not later than the 15th November of each year shall be forwarded to the Horticulturist of the Ontario Agricultural College for publication, if deemed by him to be sufficiently important.

It is suggested that one or more annual visits be made to each station by the Horticulturist of the Ontario Agricultural College at the most favorable periods for securing information for publication in bulletin form, and pointing out to the Secretary any faults observable in the station, as well as indicating useful lines of work which might be inaugurated. At the time of these visits he will be received by the experimenter as the official representative of the Board of Control as well as of the Government.

EXPENDITURE, NATURE AND NUMBER OF STATIONS.

It is suggested that ten trial stations be organized and located as follows:

No. 1. Apples and pears.....
Located Managed by

No. 2. Apples.....
Located Managed by

No. 3. Apples and plums.....
Located Managed by

No. 4. Peaches and strawberries.....
Located Managed by

No. 5. Plums and cherries.....
Located Managed by

No. 6. Grapes.....
Located Managed by

No. 7. Cherries and small fruits.....
Located Managed by

No. 8. Grapes and Currants.....
Located Managed by

No. 9. Strawberries and peaches.....
Located Managed by

No. 10. Gooseberries and raspberries.....
Located Managed by

Contingencies.....

It is believed that an appropriation of $2,000 will be sufficient to initiate and carry on this work successfully, including the purchase of plants for each station the first and succeeding years.

STATIONS PROPOSED TO BE ESTABLISHED IN THE SPRING OF 1894.

No. 1. Apples, pears and small fruits..... $100
Located in Prince Edward County.
Managed by W. H. Dempsey, Trenton.

No. 2. Apples, grapes, plums, strawberries, currants, gooseberries and cherries..... $100
Located in Simcoe County.
Managed by C. G. Caston, Craighurst.

No. 3. Plums, apples, pears, grapes and small fruits..... $100
Located in Huron County.
Managed by

No. 8. Grapes, currants, gooseberries, plums, pears, cherries and blackberries..... $100
Located in Wentworth County.
Managed by M. Pettit, Winona.

No. 9. Peaches and strawberries, currants, cherries, gooseberries, raspberries, plums and quinces..... $100
Located in Essex County.
Managed by W. W. Hilborn, Leamington.

ESTIMATED EXPENDITURE FOR 1894.

Five stations at $100	$500
Trees, plants, etc	200
Clerical work—corresponding with stations, purchasing stock for each, keeping lists, making tabulated statements for publication	50
Meetings of Board of Control	75
Travelling expenses of official visitors	75
Contingent fund	100
	$1,000

EXPERIMENTER'S AGREEMENT.

I of of the county of and Province of Ontario, do promise and agree to properly and carefully plant all fruit trees and plants entrusted to me for experimental purposes and to give them proper care in the way of cultivation and pruning, and that I will keep a record of the same and report as to the growth of the trees and plants, their hardiness, etc., size and quality of the fruit, time of ripening, and all other information required within my power and ability to give. I will be guided by the Board of Control in making these reports and report when and to whom they may direct. I further agree to be guided by the Executive Board as to plan and methods of experimental work entrusted to me. I also agree to give any information I can to, or asked for by the Horticulturist of the Ontario Agricultural College, or by the Secretary of the Fruit Growers' Association of Ontario.

In consideration of faithfully carrying out the experimental work as outlined above, and making reports as directed, I am to receive annually the sum of dollars. All trees, plants etc., entrusted to me for experimental work when once planted shall become my property, but not to be used in any way to advance personal ends, such as controlling or propagating new varieties.

Should I fail to carry out the wishes of the Board of Control, I hereby agree to forfeit all or any part of my annual grant, as considered right and just by the said Board of Control.

(Signed)

Dated

APPENDIX VI.

LIST OF PLANTS AND TREES

DISTRIBUTED BY THE FRUIT-GROWERS' ASSOCIATION OF ONTARIO FROM 1875 TO 1893 INCLUSIVE.

1875.—Swazie Pomme Grise Apple.

1876.—Glass Seedling Plum.

1877.—Goodale Pear.

1878.—Burnet Grape.

1879.—Ontario Apple.

1880.—Saunders' New Hybrid Raspberry.

1881.—Senasqua Grape; two pounds of the Dempsey Potato; Hydrangea Paniculata; Wealthy Apple.

1882.—Spirea Prunifolia; Lee's Prolific Black Currant; three bulbs of Gladiolus; Moore's Early Grape.

1883.—Rose Peonia; Worden Grape; Niagara Raspberry.

1884.—Yearling Tree of the Canada Baldwin Apple; Deutzia Crenata; Prentiss Grape; three papers choice Seed, viz., Pansy, mixed Aster and Drummond's Phlox.

1885.—Russian Apple, one year old; Catalpa, one year old; Fay's Prolific Currant, one year old; Tuber of choice Double Tulip; Three papers choice Seeds, viz., one each of Diadem Pink, Striped Petunia, Salpiglossis.

1886.—Three plants Ontario Strawberry; Russian Yellow Transparent, one year old; one plant Lucretia Dewberry, Early Victor Grape, one year old; two plants Marlboro' Raspberry; three papers Seeds, viz., Gypsophila Paniculata, Aquilegia Coerulea and Delphinium, mixed colors.

1887.—Vladimir Cherry; Dahlia; two plants Hilborn Raspberry; Niagara Grape Vine, one year old; New Single-flowered Geranium; three packets Flower Seeds.

1888.—Storm King Fuchsia; Golden Queen Raspberry (two plants); Niagara Grape Vine, one year old; package of Spring flowering Bulbs, viz., Tuberose (double Excelsior Pearl), Dahlia (Gaiety, striped flower), Napoleon Gladiolus; Jessie Strawberry; Tree of Doyenne Boussock Pear, one year old; Abutilon [double]; Ostheim, Russian Cherry.

1889.—Niagara Grape; Vergennes Grape; Princess Louise Apple; Paul Neyron Rose; Baron de Bonstettin Rose; Jessie Strawberry.

1890.—Russian Apricot; Simon's Plum; John Hopper Rose; Shaffer Raspberry (four tip plants); Wealthy Apple; Bubach No. 5 Strawberry (four plants); Richardia Alba Maculata, or Spotted Calla.

1891.—Golden White Apple; Mill's Grape Vine; Williams' Strawberry; Triomphe de Vienne Pear; two Cannas; Gen. Jacqueminot Rose; two Dahlias.

1892.—Moore's Diamond Grape; Idaho Pear; Williams' Strawberry; Gipsy Girl Apple; Japan Honeysuckle.

1893.—Rosa rubifolia; Spiraea media rotundifolia; Picea pungens; Pinus ponderosa; Pseudotsuga Douglasii; Seedling Black Currants; Red Queen Apple; Golden Reinette Apple; Crimean Apple.

APPENDIX VII.

ONTARIO FRUIT STATISTICS.

The following table contains the numbers of apple, pear, peach, plum and cherry trees, and of grape vines in the townships of Ontario as computed for 1892 and 1893, from returns sent in by farmers and fruit-growers to the Department of Agriculture (Bureau of Industries.)

Districts.	1893.		1892.	
	Bearing Age.	Young Trees.	Bearing.	Non Bearing.
Apple Trees.	No.	No.	No.	No.
Lake Erie	1,296,335	409,771	1,264,495	459,296
Lake Huron	800,837	249,856	751,637	254,074
Georgian Bay	500,747	242,374	450,135	228,953
West Midland	1,164,110	292,200	1,097,843	308,063
Lake Ontario	1,993,891	447,905	1,961,607	460,617
St. Lawrence and Ottawa	786,100	316,937	750,621	308,334
East Midland	378,917	155,799	346,407	152,896
Northern Districts	17,426	31,839	15,235	32,711
The Province	6,933,363	2,144,681	6,637,980	2,200,944
Pear Trees.				
Lake Erie	134,047	84,617	121,224	92,918
Lake Huron	46,975	27,246	45,216	28,137
Georgian Bay	22,486	33,253	17,474	32,556
West Midland	72,803	48,625	61,929	46,045
Lake Ontario	211,702	294,560	205,976	278,788
St. Lawrence and Ottawa	20,880	15,877	19,199	14,383
East Midland	12,071	9,834	14,045	10,992
Northern Districts	838	1,153	213	693
The Province	321,752	515,165	485,276	499,512
Plum Trees.				
Lake Erie	56,230	82,400	48,[illegible]	79,291
Lake Huron	36,617	37,706	59,129	40,706
Georgian Bay	85,702	89,002	93,962	85,120
West Midland	68,337	76,967	62,945	74,317
Lake Ontario	247,960	383,427	225,181	382,743
St. Lawrence and Ottawa	127,226	40,589	130,732	38,970
East Midland	31,212	22,414	30,941	24,854
Northern Districts	9,477	7,589	8,923	7,814
The Province	682,561	680,094	659,454	683,415
Peach Trees.				
Lake Erie	173,[illegible]92	158,080	141,[illegible]92	182,536
Lake Huron	10,516	7,055	9,118	8,276
Georgian Bay	1,488	3,013	1,859	1,322
West Midland	17,124	9,660	12,658	11,824
Lake Ontario	319,054	212,894	277,765	229,720
St. Lawrence and Ottawa		204		268
East Midland	20	496	198	617
Northern Districts		16		7
The Province	521,873	386,330	443,100	434,854

ONTARIO FRUIT STATISTICS.—*Continued.*

Districts.	1893.		1892.	
	Bearing Age.	Young Trees.	Bearing.	Non-Bearing.
CHERRY TREES.	No.	No.	No.	No.
Lake Erie	166,145	52,853	163,610	58,369
Lake Huron	82,713	27,535	81,138	29,420
Georgian Bay	53,293	28,769	54,796	23,314
West Midland	77,017	30,862	76,368	30,017
Lake Ontario	94,338	63,182	93,713	55,776
St. Lawrence and Ottawa	28,945	14,962	29,731	10,629
East Midland	13,954	10,046	12,348	10,684
Northern Districts	1,659	1,449	1,471	1,837
The Province	518,064	229,658	513,175	220,046
GRAPE VINES.				
Lake Erie	922,042	195,408	962,265	250,708
Lake Huron	37,506	34,335	35,715	24,762
Georgian Bay	23,194	8,774	28,455	8,052
West Midland	55,870	24,879	48,259	29,028
Lake Ontario	1,117,502	473,981	1,029,479	571,626
St. Lawrence and Ottawa	40,037	18,048	37,135	44,704
East Midland	26,013	26,864	31,911	20,605
Northern Districts	1,118	1,141	914	1,174
The Province	2,223,282	783,430	2,174,133	950,659

The districts given in the above table are comprised as follows:

LAKE ERIE. Essex, Kent, Elgin, Norfolk, Haldimand and Welland.
LAKE HURON. Lambton, Huron and Bruce.
GEORGIAN BAY. Grey and Simcoe.
WEST MIDLAND. Middlesex, Oxford, Brant, Perth, Wellington, Waterloo and Dufferin.
LAKE ONTARIO. Lincoln, Wentworth, Halton, Peel, York, Ontario, Durham, Northumberland and Prince Edward.
ST. LAWRENCE AND OTTAWA. Lennox and Addington, Frontenac, Leeds and Grenville, Dundas, Stormont and Glengarry, Prescott and Russell, Carleton, Renfrew and Lanark.
EAST MIDLAND. Victoria, Peterborough, Haliburton and Hastings.
NORTHERN DISTRICTS. Muskoka, Parry Sound, Nipissing, Algoma, Manitoulin, Thunder Bay and Rainy River.

ANNUAL REPORT

OF THE

BEE-KEEPERS' ASSOCIATION

FOR THE

PROVINCE OF ONTARIO

1893.

(PUBLISHED BY THE ONTARIO DEPARTMENT OF AGRICULTURE, TORONTO.)

PRINTED BY ORDER OF THE LEGISLATIVE ASSEMBLY.

TORONTO:
PRINTED BY WARWICK BROS. & RUTTER, 68 AND 70 FRONT STREET WEST.
1894.

A. PICKET, Esq., Nassagaweya,
President of Ontario Bee-Keepers' Association for 1894.

ANNUAL REPORT

OF THE

ONTARIO BEE-KEEPERS' ASSOCIATION.

To the Honorable the Minister of Agriculture :

SIR,—I have the honor to submit herewith the fourteenth Annual Report of the Ontario Bee Keepers' Association, in which will be found the papers read at the Annual Meeting, recently held at Lindsay, and a full report of the discussions thereon. The Report of the Foul Brood Inspector, and the audited statement of the finances are submitted herewith.

The number of Associations affiliated with the parent society is now thirteen, an increase of three over that of 1892.

It is gratifying to note that there is a very decided increase in the interest taken in bee culture in recent years, and that the expansion of the market for honey is keeping pace with the increase in the production.

Respectfully,

S. CORNELL,

Secretary.

OFFICERS FOR 1894.

President, - - - - - - A. PICKET, Nassagaweya.

Vice-President, - - - - - - R. F. HOLTERMANN, Brantford.

Secretary, - - - - - - WM. COUSE, Streetsville.

Treasurer, - - - - - - - MARTIN EMIGH, Holbrook.

Directors:

Division No. 1 ..... W. J. BROWN, Chard
Division No. 2 ..... J. K. DARLING, Almonte.
Division No. 3 ..... M. B. HOLMES, Athens.
Division No. 4 ..... A. PRINGLE, Selby.
Division No. 5 .....
Division No. 6 ..... W. COUSE, Streetsville.
Division No. 7 ..... D. CHALMERS, Poole.
Division No. 8 ..... F. A. ROSE, Balmoral.
Division No. 9 ..... J. B. HALL, Woodstock.
Division No. 10 ..... R. MCKNIGHT, Owen Sound.
Division No. 11 ..... J. MYERS, Stratford.
Division No. 12 ..... E. A. JONES, Kertch.
Division No. 13 ..... R. H. SMITH, Bracebridge.

Auditors, - - - - - - - S. T. PETTIT, Belmont.
JACOB ALPAUGH, St. Thomas.

Foul Brood Inspectors, - WM. MCEVOY, *Inspector*, Woodburn.
F. A. GEMMELL, *Sub-Inspector*, Stratford.

LIST OF MEMBERS FOR 1894.

Name.	P. O. Address.	Name.	P. O. Address.
Aches, J. B.	Poplar Hill.	Gale, H. E.	Armstrong, Que.
Aikin, Wm.	St. Marys.	Gerrow, J. J.	St. Rose (Algan.
Alpaugh, J.	Galt.	Gemmell, F. A.	Stratford.
Armstrong, John.	Streetsville.	Gilbryth, Robert.	Kenwood.
Artley, Wm.	Walter's Falls.	Gordon, M.	The Brook.
Bean, H. J.	Black Creek.	Haberer, Jacob	Zurich.
Bellerose, L. H.	St. Monique de Nicolet	Hall, J. B.	Woodstock.
Bernard, Rev. C.	Joliette, Que.	Harkley, John	Walkerton.
Black, Rev. J. R.	Kingston.	Hess, D. W	La Moille.
Black, Alex.	Sonya.	Hollis, Jas	Smith's Falls.
Blais, A. J.	Glen Sanfield.	Hopkins, Thos.	South Edmonton, N.W.T
Blay, Augus.	Wyebridge.	Hurwitt, Thodule.	Clarence Creek.
Bonner, A.	Linwood.	Hillsdon, W. A.	Ingersoll.
Boyd, Calvin.	Petrolia, Box 442	Holmes, M. B	Athens.
Brabant, Samuel.	Beauharnois, Que.	Holtermann, R. F.	Brantford.
Brenton, E.	Cornwall.		
Bridge, A.	Westbrook.	Ira, Wilson	Harrow.
Brown, W. J.	Chard.	Irondale, John.	Dundas.
Brown, Dennis.	Chard.		
Brown, Joseph	Adelaide.	Johnston, Thos. E.	Malakoff.
Bullen, Miss H. F.	Campbellford.	Jones, E. A	Keene.
Bundy, John	Linwood.		
		Kay, James	Port Sydney.
Calder, J. W.	Lancaster.	Kyle, Mrs. Bennett	North Winchester
Calvert, John.	Walsh.		
Chalmers, D	Poole.	Laflamme, Francis	Clarence Creek.
Charbonneau, Jos.	Plantagenet.	Landry, M.	Clarence Creek.
Chrysler, W. A.	Chatham.	Langford, Albert	Maple Grove.
Clarke, Rev. W. F	Guelph.	Langley, J. B.	Wellesley.
Connor, C. F.	Marlin.	Lapner, Maxwell	Paton.
Cosse, Wm.	Streetsville.	Lamgmead, Allan	Britannia.
Crosby, A. J.	Compton, Que.	Lamdy, Benjamin	Martintg.
Cruikshank, J. M.	Lyons.	Leah, N.	Peterboro'.
Culver, Chas. W.	Simcoe.		
Cushner, D. N.	Florence.	McArthur, A. D.	Martintown.
		McAuslan, James	Beatrice.
Darling, J. K.	Almonte.	McArtley, W.	Walter's Falls.
Darling, S. F.	Perth Road.	McCartney, R.	Rosehall.
Deadman, G. A.	Brussels.	McCauley, Thos.	Greenbush.
Dickinson, Edward	North Glanford.	McCrimmon, J. J.	Langton.
Dickson, John	Dunvegan.	McDonald, S.	Mount Pirk.
Duncan, Dr. George	Linton.	McDonald, R. A.	Greenfield.
		McDonnell, R. W.	Galt, Box 105.
Edwards, James	Angerton.	McDougall, A. R.	Glen Norman.
Elliott, J. C.	Caledon Place.	McEvoy, Wm.	Wyndburn.
Emigh, M.	Hallowell.	McKnight, R.	Owen Sound.
Emerick, Robt. B.	Tyrrell.	McLean, Rod.	Hopeweil, N. S.
Engle, Conrad	Poole.	McMillan, D.	Glen Robertson.
Evans, J. D.	Islington.		
		Mark, Jas.	Vaughan.
Fairley, H. J.	Hamilton.	Massey, Jas.	Poston's Corners.
Farquharson, D. R.	Alvinston.	McGhee, Fred.	Dunton.
Ferguson, J. R.	Williamstown.	Miller, E. J.	Lowville.
Ferguson, G. W.	Lambeth.	Missener, J. G.	North Cayuga.
Fewer, K. A.	Cornwall.	Mixon, Thos.	Carlsbulne.
Freeman, F. C.	Newtonv.	Morrison, V.	Dunvegan.
French, Augustus.	North Gosfield.	Munro, D. W.	Martintown.
Fulton, Wm.	Hamilton.	Myers, John.	Armstead.
Fyfe, Albert.	Harriston.	Mayes, R. H.	Stratford.

Expenditure.

Grant to Affiliated Societies	$200 00
Grant to Industrial Exhibition	25 00
Grant to Western Fair Association	10 00
Secretary's salary	50 00
Treasurer's salary	25 00
Auditors' fees	4 00
Directors' and Officers' railroad expenses and allowance for board	196 10
Periodicals for members	75 00
Printing for 1892	24 22
Expenses of committee *re* so-called "Sugar Honey" legislation	80 76
Expenses of Representative to Toronto Exhibition (*re* prize list)	5 60
Treasurer's expenses to convention	12 75
Letter-press book for Secretary	10 15
Miscellaneous	26 40
	$744 98
Balance on hand	$ 46 04

We, the Auditors, have examined accounts and vouchers and receipts as per above account, and report all correct.

R. F. Holtermann.
R. F. Whitesides.

Mr. McKnight: I believe that this is the first occasion in the history of The Ontario Bee-keepers' Association when they have not a clean sheet to show, or when they have not something to their credit. If I understood the report aright, it is not as satisfactory as I would like to see it. As far as the receipt of the money is concerned and its disbursement, the Auditors' report is thoroughly satisfactory, but I think, if I understood the statement, that there are outstanding liabilities against this Association which have only been hinted at, and the members of this Association are in the dark as to their extent. We have an agreement with a certain firm to furnish the members of this Association with a certain substantial return for the money that was paid them. That firm in the meantime dissolved. The responsibility I think still continued to supply, but circumstances were such that they could not possibly do so and the duties were transferred to another and a different firm. That is the situation as I understand it. What arrangement was made between these two firms, I don't understand. I question if there are many present who know anything about it. It is not our business at all, if we had received what we contracted for and what we paid for. We did receive it, but in a different form from what we expected, and the result is that because of this change there is an undefined liability against this Association, the amount of which we are not put in possession of, either by the Treasurer or by the Auditors. The amount, as near as they can arrive at it, should have been stated, and the money now shewn as a balance of cash on hand would shew our correct position. We have forty odd dollars to our credit, but we have liabilities to meet which we contracted last year. The amount I don't know. I have met nobody that could tell me. My impression is that instead of having forty-six odd dollars to our credit, we would be on the wrong side of the ledger. That is my own impression. What I was going to point out more particularly is that when that is ascertained and discharged, and the balance is shown on the wrong side, this will be the first time in the history of The Ontario Bee-keepers' Association that such a thing has happened. We have always had a cash balance. If our liabilities contracted last year were paid up there would be a different result. The lesson to be learned is that it is our duty to live within our means; that we will not contract debts that we have not the means of discharging. I have been secretary for a number of years, and, I believe, succeeded every time, so far as I was able to do, in keeping the expenses during the year within the limit. I think that should be remembered; that we should look to and insist upon it. An Association's credit depends altogether upon its being able to meet claims. If it cannot do that, it is bankrupt.

Mr. Holtermann: The account of the Beeton Printing Company is somewhere in the neighborhood of $120. This liability and whatever expenses will be incurred at this meeting are all the liabilities that the Association have, so that the members can form a pretty accurate idea.

Mr. CORNEIL: The account rendered by The Beeton Publishing Company against this Association up to the 27th June last from the 24th of January is $127.38. As far as the subscriptions to *The Canadian Bee Journal* are concerned, this account is correct, with the exception of three items of fifty cents each. There are, as I have said, other charges, for instance there is letter-heads, $6.75, and envelopes, $4. On this account $75 have been paid. I might, perhaps, as an item of information, say that the Executive Committee did not consider themselves warranted in paying this account in full under the circumstances referred to by Mr. McKnight—relative to the change in the *Bee Journal*. We thought it better to leave it to be dealt with by the Board. It has not yet been submitted. No action has been taken.

Mr. HOLTERMANN: It might be of interest if I would state our side of the case.

Mr. PRINGLE: I would like to know whether the new Company proposes to carry out the obligations of the Beeton Printing and Publishing Co.

Mr. HOLTERMANN: At different times, in one way and another, the former publishers of *The Canadian Bee Journal* approached us in regard to the purchase of that publication. So far as I was concerned I always said I would be pleased to see the Association take hold of *The Canadian Bee Journal*, and, that in case we should, we would support it in every way in our power. It has always been considered by the leaders—if I may call them so—that they did not see their way to publish the *Journal*. It finally came to this: There was an offer from the United States for *The Canadian Bee Journal*. I must confess that I did not like the idea, and I did not think that it was in the interest of Canada that they should not have the *Canadian Bee Journal*. I knew from examining the accounts that paper had never paid, and we need only examine the *Journal* to see that it was not of the value that it should be. It was impossible to have a weekly bee journal. It was also impossible to have it once in two weeks, everything considered, and, after urging the firm with which I am connected, they decided to make the attempt. We agreed to publish a monthly *Journal*, and to assume the liabilities of the old firm; that is, any one who had paid the subscription a year in advance would be sent the *Journal* for that length of time. We received nothing whatever from the old firm for that. Although there were from sixteen to eighteen hundred subscribers on that list, there were only four or five hundred subscriptions paid up. It was therefore an absurdity to think of publishing twice a month. I think there is no one here present who would desire to have Canada without a bee journal. There is something necessary to bind the local Associations and the Ontario Association together, and, for that reason and many others, it would be a great injury to Canadian bee keepers to have the publication under the control of a United States firm. We are trying to make the *Journal* as good as we can. It is not paying. We are making every effort to have a good *Journal*, and we are earnestly anxious to have you support us in that effort. I think you will agree with me that we are not attempting to use the columns for our own purposes. That is the position of affairs.

A MEMBER: Did you assume any responsibility further than to supply the *Journal* to members?

Mr. HOLTERMANN: Whatever subscriptions had been paid in advance, we agreed to send a monthly that length of time.

Mr. MCKNIGHT: Outside the interest we all took in it as a pure and simple business transaction, The Ontario Bee-keepers' Association do not know any one except the late publishers of *The Canadian Bee Journal*. That would be the position in law any way. The contract was entered into between that Association and that Company. The Association agreed to pay a certain amount of money for certain substantial returns. If by any means that Company could not carry out its contract and transferred its liability to another concern, we don't know that concern. If there was an honest agreement made between them that the obligations of the one were to be assumed by the other, that was their business. I believe they have carried out their agreement, but what I would like to know and what I don't quite understand is whether The Beeton Publishing Company's account covers all claim against this Association or whether the Company to whom they gave over their right and interest also has a claim.

Mr. CORNEIL : The Beeton Publishing Company only claims up to the 27th of June.

Mr. MCKNIGHT : Does the Company to whom it was transferred make any claim on us?

Mr. HOLTERMANN : No.

Mr. MCKNIGHT : Our only liability then is the account of the Company with whom we made the contract?

Mr. HOLTERMANN : Our Company makes no claim.

Mr. MCKNIGHT : I understand, then, that no claim has been made or will be made from any other source than the Beeton Publishing Company.

Mr. COUSE : Are we willing to pay the full amount? Have they given us what they agreed to?

Mr. CORNEIL : That is a matter that should be decided by the Board. This whole discussion in reference to the *Journal* has grown out of the wish of one of the members to know the position of affairs. I think that any further action with regard to this matter is the work of the Board.

Moved by Mr. MCKNIGHT, and seconded by Mr. PRINGLE that the financial report be adopted. Carried.

SECRETARY'S REPORT.

LINDSAY, January 9th, 1894.

To the Members of the Ontario Bee-Keepers' Association : I beg to report that the number of members in 1893 was 193. Three new local Associations were organized during the year in the extreme eastern part of the Province and affiliated with this Association. The total number of affiliated Associations during the year was thirteen. Four of these have already affiliated for 1894. It seems that the date for affiliation as provided for in the by-law, May 1st, is too early, some of the societies not holding their summer meeting until after that date. I would suggest that the by-law be amended, making June 1st the latest date for affiliation, instead of May 1st.

S. CORNEIL, Secretary.

Moved by Mr. HALL, and seconded by Mr. ACHES, that the report of the Secretary be adopted. Carried.

PRESIDENT'S ADDRESS.

Mr. F. A. GEMMELL then delivered the following address : Another year having passed since I made my first address before this Association, I am pleased to have the privilege of attempting a second, hoping that all will kindly treat it with as much leniency as was done with my former one. Possibly, however, you may think that the excuse then given for its defects ought not to hold good on this occasion, as by experience one is expected to improve. Be this as it may, I nevertheless intend taking refuge behind the fact that, as the programme arranged for this Convention is an exceedingly long and interesting one, I am compelled to seek and adopt the motto that "brevity is the soul of wit."

With this as a preface, I suppose that I cannot do better than to state that, while the past season was not what we, as bee-keepers, would have desired, still it might have been worse; as, on account of the very severe winter, causing a great mortality among the insects, as also another very backward spring, the laborers were not as numerous when the clover commenced to yield, as we would have liked them to be. Yet for all, it was a great treat, notwithstanding the scanty, and in some localities the entire absence of any flow from linden or thistles, that the abundant yielding qualities of our favorite white clover once more enticed the bees to do good work during its three or four weeks of nectar secretion, and bee-keepers being an enthusiastic and hopeful lot of mortals, we as a matter of course will prepare for the big flow (that has been so long in coming) which we really look for next year.

I am pleased to see that our meetings are still improving, both in regard to number of ladies attending and the increased interest all, as a rule, are taking therein. This is as it should be, and if we can only entice our apicultural sisters and brothers to still further assist in making our conventional gatherings more attractive to outsiders, by giving suitable entertainments such as already proposed by myself (and I understand to be carried into effect here, a large amount of error and superstition in regard to our pursuit will vanish, and a still larger amount of one of the most healthful sweets will be consumed in the near future.

Another source of pleasure to me, and I am sure to all engaged in honest honey production, is the deep interest that both the Provincial and Dominion Governments are taking in our chosen calling, a thing by the way, which should have been done before. However, lest I may be misunderstood as complaining, I may say that if such action has not been taken before, it has rather been the fault of ourselves than that of our legislators. In addition to what we have already secured, I am assured the coming session of the Dominion Parliament will grant the law regarding the "sugar honey fraud," the particulars of which the deputation that waited on the Minister of Agriculture will shortly give you.

As to the honey exhibit at Chicago, I will merely state that its importance to Canada cannot be too vastly estimated, but as Mr. Pringle, the gentleman in charge of said exhibit, is also with us, it would be both unwise and indiscreet to attempt to say anything more than simply draw your attention to the fact that I have not overlooked it; especially as I embraced the privilege of gazing on the same while in Chicago viewing the other great sights of the "White City," as well as attending the also great North American Bee-keepers' Convention.

As another proof of the advancement of apiculture, especially in Ontario, I might refer to the increase of our local organizations, several of which have sprung into existence during the past year, with good prospects of others soon following. As a member of a number of local or county associations, possibly you will not think me as assuming too much if I assert that, as a rule, their importance in the past has just been a trifle undervalued, as I do know for a certainty that some very important matters have had their origin therein. I consequently offer the suggestion, that the secretaries of such associations correspond with each other, giving information of the date and place of meeting, with the view of having any subject of special interest to all more fully discussed before being presented to the Ontario Association.

The next subject that I would bring before your notice is the marketing of honey—a subject which, by the way, I touched upon last year, and which, although often mentioned in periodicals and occasionally discussed at conventions, is to me not yet threadbare by any means. And the remedy is still not yet satisfactorily solved, at least in some quarters. My own individual efforts have thus far proved unsuccessful in my own neighborhood, for the reason that the majority of those (especially the small producers) seem to think the larger towns and cities the best places for disposing of their crop, instead of endeavoring to find or build a market in the immediate vicinity where the honey is produced; consequently when marketing a supply, and not finding as high a price as expected, rather than make any further attempt to secure a reasonable price, they accept anything offered them, sometimes almost giving it away. (The latter way of disposing of it is no doubt attributable to the generous disposition most bee-keepers are

supposed to possess.) We must encourage more local or home consumption, as the margin between the wholesale and retail dealer is now so small that the former will not much longer continue to handle our product. Let us hear from Mr. Holtermann and others concerning their views of the case.

Having now arrived at the last topic of my address, viz., foul brood, I need not inform you that it is my earnest desire that this nuisance should be entirely wiped out of existence, and I hope that you will not think me over-presumptious in stating (more especially as I have learned through my official capacity the dread others have of having the stigma attached to their apiaries) that the disease does not now exist in my apiary, nor has it done for some time; neither has the scourge any foothold in my once much advertised locality. With the assurance that Mr. McEvoy has again done efficient work during the season just closed, I need only add that I look soon for the total extermination of the pest from our midst, and in this I am sure you will rejoice with me.

Lastly, allow me once more to thank you for selecting me to fill a second term in this capacity, as well as add my concluding sentence, which I doubt not many of you have been looking for some time since, that I have endeavored to carefully and expeditiously carry out the duties devolving upon me during the past year.

I will close by wishing you a bonanza crop and remunerative prices for 1894.

Mr. HOLTERMANN: I have listened very attentively to the President, Mr. Gemmell. I am sure there are a great many points worthy of our consideration brought out in his address. He mentioned my name in regard to local markets. During the last ten days I have been travelling through the northern part of the province, and as at home we have honey for breakfast every morning, and being at an hotel, I thought I would try to get a little bit of honey. I went from store to store, and I could not find one pound of honey in a store in Perth. There is something radically wrong there. There are parts of the province where we hardly know how to sell our honey at a reasonable price. There are other parts of it where it can't be purchased. Why is it that they will sell almost every product but honey? Bee-keepers have failed in one direction, and that is that we are not allowing the merchant a sufficient margin on his sales. Supposing honey is retailing at ten cents, we find, unfortunately, that bee-keepers, or a great many bee-keepers, will prefer retailing honey at nine cents to wholesaling at eight and retailing at ten. The difficulty is simply this. Just as soon as we come down in retail we must eventually come down in wholesale prices. The wholesale man is able to reach a great many customers when we cannot reach them. If we keep the retail price right, I don't think the tendency will be downward, as at present.

Moved by Mr. HALL, seconded by Mr. HOLTERMANN, that the thanks of the Association be tendered to the President for his kindness and efficiency in the past. Carried.

LETTER FROM REV. W. F. CLARKE.

A communication from Rev. W. F. CLARKE, of Guelph, was here presented and read by the Secretary. The letter is as follows:

GUELPH, Jan. 3, 1894.

To the Ontario Bee-Keepers' Association, in annual meeting assembled.

I feel it my duty to bring before the Association a matter of privilege. At the meeting of the Oxford Bee-Keepers' Association, held in Woodstock, Ont., June 1st, 1893, it was moved by J. B. Hall, seconded by Wm. Goodyear, and resolved unanimously: "That some of the writings of W. F. Clarke, signed 'Lindenbank,' in the Montreal *Witness*, upon bees and honey are very erroneous and misleading, and the Association believes that the writings of the said W. F. Clarke, not only in the Montreal *Witness*, but in other papers, are doing great injury to the business of bee-keeping; therefore, the Montreal *Witness* is hereby respectfully requested to discontinue publishing anything from the pen of the said W. F. Clarke upon the subjects of bees and honey, and that this resolution be published in the Montreal *Witness*." The proprietors of the *Witness*, of course, forwarded the communication to me, as properly belonging to that department of the paper of which I have had charge now for about 30 years, and I, regarding it as beneath

contempt, took no notice of it. But this Oxford Association is affiliated with the O.B.K.A., of which I am a member, and I lay it before the body as a question of privilege. I have no words in which to express my utter abomination of the spirit of intolerance herein displayed. These men are worse than those who used to burn heretics in days of old. They do not specify my heresies, nor do they give me a chance to retract. Because some of my writings on bee-keeping are not acceptable to these narrow-souled men, I am to be squelched and silenced. I have ever courted the freest criticism of my writings, but this is not criticism, it is persecution: it is gross defamation: it is an interference with my right of free speech, which I resent as an insult to my manhood and common sense. I believe the resolution is actionable for damages, but have taken no legal advice on the subject as yet. It is a direct assault upon my means of getting a livelihood, and is harmless only on the supposition that the parties who passed it are destitute of influence.

Respectfully submitted,

W. F. Clarke.

The reading of Rev. Mr. Clarke's letter was followed by a warm discussion. In defence of the action of the Oxford Association, it was alleged that Rev. Mr. Clarke wrote an article for the Montreal *Witness* on extracted honey, in which, through misrepresentation of the facts, he tried to create a prejudice against honey in the liquid form, thereby doing serious injury, not to one bee-keeper only, but to hundreds. On the other hand it was contended that, assuming the charge to be true, it is highly improper for the members of any association to constitute themselves censors of the press and assume to dictate to the proprietor whose writings he shall not publish; that, instead of attempting to silence Rev. Mr. Clarke on the subject of bees and honey, the proper course would have been to send a correction of his misrepresentations to be published in the columns of the journal in which they were made.

It was finally decided to leave the matter over for the present, to be dealt with later on.

EXTRACTED HONEY.

By R. H. Smith, Bracebridge.

There is very little difference in the management of the bees up to the commencement of the honey flow, whether we produce comb or extracted honey. Colonies that have come out of winter quarters in good condition and escaped all the damages of changeable weather and spring dwindling, are usually booming by the time clover has commenced to yield honey, and if supers are not put on swarming commences. But if the apiarist wishes to run for honey, and does not desire increase, he will have provided at least two supers for each strong colony, filled with combs or comb foundation. Just before the bees get crowded I take out one or two combs containing a little brood with the bees adhering, being careful not to take the queen, and I then fill up the space in the brood nest with empty combs. The combs with brood are placed in the centre of the extracting super, and after placing a perforated metal board on the body of the hive the super is placed on the hive, and the bees will want little attention for some days, there being no danger of swarming. If the flow is good they will probably require another super in about ten days, when the first may be raised up and another containing empty combs placed next the brood nest. This, with the average colony, is sufficient, as the supers have a capacity of one hundred pounds each, and as we have an interval between clover and linden the clover honey is well ripened and sealed by the bees, and may be extracted and the combs replaced, ready for the linden or fall flow. Some years ago we practiced extracting from the brood chamber, when most of the brood combs were taken out, the honey all extracted, be it little or much, and if the person who turned the basket was a little careless the larvæ and more or less pollen would be thrown out. It is next to impossible to get a first class article of extracted honey by such methods, and I believe more bees were lost by robbing them so bare than from any other cause; but that, like the old way of brimstoning bees, is of the past. With regard to ripening extracted honey by artificial means, many bee-keepers have gone to considerable trouble to provide solar evaporating tanks and other means to ripen their honey, and while it may be necessary in certain localities and with

some kinds of honey, the average bee-keeper will find, if he will provide plenty of combs, the bees will ripen and seal the honey under the cheapest and best possible conditions, and if extracted and run into vessels that can be covered tightly, so that it cannot absorb moisture from the atmosphere, it will retain the flavor and aroma that is so highly prized in comb honey. Honey produced under these conditions will create a market for itself if properly put up and brought to the notice of the consumer.

QUESTION: What would you do supposing you had not combs to furnish?

Mr. SMITH: Give them foundation.

QUESTION: Which would you prefer, combs or foundation?

Mr. SMITH: Combs, if they are clean and nice.

QUESTION: What size supers would you use?

Mr. SMITH: On the average, it would hold one hundred pounds. The advantage in having this super is that, as it gives the honey a better chance to ripen, it is to be preferred.

Mr. CORNEIL: Do you let your queen into the upper storey?

Mr. SMITH: No; Mr. Jones used to extract from the lower storey alone. The object in putting brood up into the upper storey is to draw the bees up. They do not breed there.

Mr. PETTIT: Do you recommend the Jones hive?

Mr. SMITH: I think it makes practically little difference.

A MEMBER: Do they winter well?

Mr. SMITH: Fairly well. As well as any.

Mr. ACHES: Do you recommend the large super?

Mr. SMITH: I think it makes very little difference if the weather is warm and the bees strong. When the brood is placed in the centre they do not get chilled. As they need room they spread out.

Mr. GEMMELL: You will understand, Mr. Aches, at the time he gives the additional super it is pretty well on in the season. The result, according to my experience, would be better with a smaller super. I put on a super of twenty-five to fifty pounds.

Mr. PETTIT: The great drawback would be the two sizes of combs.

Mr. COUSE: I would like to say, in regard to the Jones hive, that I put the upper storey on without the brood. The consequence was that it was too large. They swarmed. I would recommend something smaller; a lower frame.

Mr. HOLTERMANN: When Mr. Couse used the Jones hive, I had some experience with it too. We are inclined to think that one upper storey in sufficient. We are working at a disadvantage so long as we do that. We can get this advantage of more room by using the Langstroth frame. I am not a hobbyist on the particular size of frame to use, but, at the same time, it appears to me that if we can get these advantages by using a frame that is generally used, would it not be better to use it? We know supply dealers throughout the country are in a position to give us the Langstroth frame. Would that not be sufficient recommendation for us to adopt it?

Mr. HALL: What makes the Langstroth frame a "standard"?

Mr. PRINGLE: About thirty years ago, when I bought my first swarm of bees, I had them put into a Langstroth hive. The next time I started I got a Jones hive. I did not like them for the production of comb honey, and for extracted honey they were too heavy. I am now using the Langstroth frame. I suppose it is called the "standard" frame because it is generally used. It gets its name from the inventor, the Rev. Mr. Langstroth. It is a happy medium. I have used half-storey frames, or frames that are only six inches deep. At the time you wish to give your colony more room in the spring, you can give them a half-storey. Even if the bees seal them all over, it is very little trouble to uncap them. They are much easier handled. When

Mr. Langstroth invented his hive, he invented that frame. It was not too deep. It enticed the bees to enter the super because it was not too deep.

Mr. HALL: Mr. Langstroth did not make that frame. A number of others took it into their heads that it was the best thing to sell. Moses Quinby, a chum of Mr. Langstroth's, had the eight-frame Quinby. They found that the size of hive they wanted. Mr. Langstroth was a splendid bee-keeper, but he did not produce honey by it. Mr. Quinby made his bread and butter by it. I have used the old Moses Quinby hive for over twenty years. I have been fool enough to twice alter that. I have 120 of these hives in my possession now. I can get as good results in any department of bee-keeping, whether in the production of comb or extracted honey. The "standard" is in the man not in the hive.

Mr. GEMMELL: I would like to tell you that in Moses Quinby's book he states that he had received a hive from Mr. Langstroth.

Mr. HALL: Don't call it "standard."

Mr. PICKET: A question was asked Mr. Smith in reference to placing comb or foundation for the bees. The majority of my hives are the old Jones hives. Upon placing our swarms on comb foundation, we found that we could get more honey from the foundation than from the comb. You all know that those swarms that arrive early do not produce honey like those that come late in the season, from the fact that they came at a time when the flow is not at its best.

Mr. PETTIT: Do you say that of two swarms of equal size, at the same time, one supplied with foundation and the other with empty combs, that the one supplied with the foundation would give you better returns than the one supplied with empty combs?

Mr. PICKET: It seems unreasonable, but I found it happen with me. Combs that are more than a year old require some work before they are fit for the reception of honey. When the flow is at its height they will draw out foundation and fill it with honey quicker than they will fill empty combs.

Mr. GEMMELL: You use a six-inch deep storey, Mr. Smith. Do you not find that the bees are apt to swarm? The object of putting the brood above is to prevent swarming and draw the bees up. Don't wait until they need more room. Give them plenty underneath. It is not necessary in all cases that extracted honey should be sealed in order to be ripe. I have seen some thicker that was not sealed. You can clear up those half-storeys.

Mr. CORNEIL: I think beginners should be warned against the half-storey. There may come a time when they will desire to let their queens up into the upper storey. Last season I had one yard in which I had forty-two colonies. In the first place, I keep the perforated metal over the first storey; put two storeys on top of that, each containing ten frames, 10x16 inside measure. Later on, when the hive got very full of bees, I let the queen into the second storey. I subsequently raised the second storey—bees, brood and all—to the place of the third storey. I did that so that I would have plenty of brood in the upper storey about the time clover would be done and buckwheat commencing to yield. When buckwheat honey threatened to destroy the white honey, we extracted the honey from the second storey, hunted up the queen, and put her into the first storey, carried the third storeys into another part of the yard, and from those I made my increase. From thirty five treated in this way I had over eighty nuclei. I had somewhere about forty or fifty wintering. My point is that when such a movement as this is desirable, if you have not your combs all alike you can't do it.

Mr. McEVOY: Where they are running for extracted honey, half-storeys should be used in every place in the world. Take the locality in which I live. Uncap honey in the evening—they will rush that honey into the upper storey. From these half storeys I have secured a crop of spring honey. This year I had seventy five.

Mr. HOLTERMANN: In going through the country how many places do you find like that? You know that you are in a locality where there is a great deal of fruit.

Mr. McEVOY: No. I am going to get the bees strong. That is the same in other localities. I am outside of the fruit belt. These half storeys answer the great purpose.

The more bees you get the more honey you get, and the more honey you get the more money you get, and that is what we are after. There is no bee-keeper on earth but should have half-storeys.

Mr. HOLTERMANN: What do you do with this spring honey?

Mr. MCEVOY: Leave it in the super. There is no bee-keeper in the business but should keep his eye on the brood chamber. In the spring this uncapping creates a flow. I would give the brood a heavy feed. If you uncap a hive you let too much heat out. When the combs in these half-storeys are uncapped you don't find any starved larvæ. Did none of you ever find your larvæ on their backs? When you find a lot of dried larvæ uncap as quickly as you can. Feed your brood. These half-storeys are really necessary, and if you don't get them you miss it—that is, for extracted honey

Mr. SMITH: I think there is quite a difference between Mr. McEvoy's locality and ours. By the time we get bees ready to take half-storeys, they are able to take large ones.

Mr. WELLS: I do not agree with Mr. McEvoy about the half-storeys. It is too much work. My hives are between Jones and the Langstroth. I want all my frames to be one size. When my hives get full of bees I put on a top storey. Sometimes I take out some brood, and if there is a great deal of honey I put some on the top. When that gets full, I put some under it. I find I can get a great deal more honey than with a smaller frame.

Mr. MCEVOY: Did you ever try the system I spoke of?

Mr. WELLS: Yes, and got tired of it.

Mr. MYERS: I was going to remark that this has dropped into a discussion on hives. It does not make any difference what kind of a hive you use. One point has been overlooked. It was brought to my notice by a question asked here. It was something like this: If you have not got either comb or foundation, what are you going to do? The bee-keeper is rather in a bad fix. It would be his best plan to lay out his last dollar in comb or foundation it he is going to produce honey. What he has to bear in mind is to leave the honey right in the hives until the very last thing; and if you have not got combs, spend your last cent. in getting them, but leave the honey until it is thick. If you have not got combs, and you take the honey before it is ripe, it will ruin your reputation as a honey-producer.

Mr. PETTIT: Get a sufficiency of comb. You must use foundation if you have not comb. I guarantee this, that if our combs are clean, the bees will go right up into them. I have combs now twenty years old. They have been used twenty years in succession in the upper storey, and are white now. The bees ask no questions. They go right up and take possession of them. The idea of taking a couple of combs up to prevent the bees from swarming is right. It will do that. The real reason, though, why swarming is prevented is because these combs are taken from the centre. This gives more room, and that is what they want. If you take anything from the brood chamber, you usually get something that is not in keeping; that honey goes along with the other honey when you extract, and you injure the whole. Take a couple of frames out to prevent swarming. Have some colonies somewhere else and put them there. I want to talk about this foundation. Mr. Picket's remark as to what is the proper thing to do should not go out from this Convention.

Mr. SMITH: There is one thing I did not explain—what we do with these combs. We do not extract from these. There may be some pollen. We use them for colonies in the fall.

Mr. MCEVOY: Mr. Corneil has asked a very important question about how long it would take to uncap seventy-five colonies. It only takes about eight hours, not longer.

Mr. CORNEIL: That is just six and one-half minutes to each hive.

TUESDAY EVENING SESSION.

Upon re-assembling in the evening, the President called upon Mr. R. MCKNIGHT, of Owen Sound, for an address, of which the following is a report:

HONEY.

I may say it is a rather trying ordeal for a man to face an audience and attempt to interest or instruct it in these days when the schoolmasters are abroad in such numbers. A few days before I left home I received a card from the Secretary saying I had been selected to say something by way of filling up the programme on one of the evenings during the sessions of this Association. My circumstances were such that I had no time or opportunity to make preparation for doing so, or even to think or fix upon a topic. On mentioning my dilemma to our President, Mr. Gemmell, to-day, he generously came to my rescue, and suggested "Honey" as a good subject to treat on such an occasion. I am very grateful to him for thus furnishing me with a "text." It is a very commonplace one to treat before an audience of bee-keepers—an audience composed of the brains and matured experience of the class to which they belong in this province. Still, the topic has something in it we don't all understand, and by way of demonstrating this I ask Mr. Blank down there in the audience, "What is honey?" Mr. Blank pauses a while and replies, "Why, honey is honey; everybody knows what honey is." Your answer to the question is a very unsatisfactory one, sir. I will furnish you with a better definition, but one you may not find in the dictionary—one, however, that suits me well enough: Honey is a translucent, saccharine syrup, that all children and most grown up people are fond of. Now, Mr. Blank, No. 2: Where do we get honey? You answer, "We get it in bee-hives." Good. And how came it in the bee-hives? "The bees collected and stored it there." Good. And where did the bees get it? "In the flowers, of course." Aye, and where did the flowers get it? Now you hesitate. That is evidently a "poser." Well, it is the consideration of the last question I propose discussing for a few minutes this evening. I set out with the assertion that the atmosphere is the source whence our honey is derived, and I say, further, that the substance of every green thing on the earth's surface—from the tiny plant to the monarch of the forest—is mainly derived from the same element. Science has clearly demonstrated this fact. It is a fact that is easily demonstrated, too. Fell a tree and burn it up; the ashes that remain represents just what of its substance came from the soil. The rest is driven off and mingles with the air. It is another instance of "dust to dust," and the balance to the source from whence it came.

To understand how honey, and plants and trees from which it is collected have their origin in the atmosphere, we must know something of the composition of the atmosphere, and the nature of plant life. Here let me say that one of the advantages of bee-keeping is that the prosecution of it leads intelligent, observing people into channels of thought they would not otherwise enter upon. To understand it fully, the domain of science must be pretty well cultivated. Hence the bee-keeper of an enquiring mind finds in it ample scope for the exercise of his talents, and usually becomes an enthusiast in the business.

The constituents of the atmosphere in the main are no longer a secret. Every schoolboy knows that it consists of oxygen and nitrogen, in the proportion of nearly one to four in volume, but it has other elements as well, one of which is carbonic acid. This is the source from whence we derive our honey. It is the source, too, that nourishes, and repairs and builds up the plants and trees that secrete honey. The proportion of carbonic acid in the atmosphere is comparatively small, being only about four-tenths of one per cent. of its volume; yet this fraction is quite enough to supply the wants of the vegetable world.

It has been estimated that there are 28 tons of carbon in the atmosphere that overhangs each acre on the earth's surface. As less than a third of the earth's surface is covered by vegetation, and as the atmosphere is ever in motion—moving from place to place—and as the loss of carbonic acid through its appropriation by living plants is ever being given back to it through the decomposition of vegetable matter, there is and will continue to be in the atmosphere ample carbon to supply the ever recurring wants of the vegetable kingdom. Hence we may look forward to an annual honey crop while the plant remains as now constituted not always uniform, however. It remains for me now to outline how living plants elaborate honey from the carbon of the atmosphere

We can only understand this by knowing something of structural and physical botany. We will select a tree for our purpose, because it appeals more forcibly to our senses than a tiny plant. What, then, is a tree? I answer it is at once a living and a dead thing. Every particle of matured wood it its trunk and branches is dead matter. It is death preserved from decay by its environments. It has in it no power to aid in the further nourishment or development of the tree. The leaves, the bark (especially the inner bark) and the sapwood alone are alive, and in these the work of nourishment and development are carried on. It is in the leaves especially that the elaboration of suitable food for the plant or tree is carried on. We ought, therefore, to know something of the structure of a leaf in order to understand our subject. But time forbids a close investigation of it. Suffice it to say that its pores and cells are what we are more particularly concerned with, the cells especially, because it is in the cells honey is elaborated. The epidermis, or outer skin, of a leaf is closely studded with pores. These pores range in number from 800 to 170,000 to the square inch of surface, and it is through these pores the carbon of the atmosphere is absorbed and received into the cells where it is worked into honey. Cells also abound in the inner bark of branch and stem. They are especially active in the interposed cambium layer, lying between the newest strata of wood and bark. These are annually renewed and maintain a living communication between the rootlets on the one hand and the foliage on the other. These cells, wherever found, contain protoplasm which has definite relation to neighboring cells, and with the outlying carbon of the atmosphere. Protoplasm is the living, active matter of the plant or tree. When the carbonic acid of the atmosphere is received into the protoplasmic cells of the leaves of plants and trees, it undergoes three changes before it is fitted for cell building. It is first converted into starch, which is the basis of honey; then into sugar, or honey if you please; afterwards into cellulose, which is fully elaborated plant food.

Every green plant contains starch, therefore every living plant has in it the basis of honey. Who then will dogmatically assert what are and what are not honey producing plants? But this is not germane to my topic. I have said when the carbon of the atmosphere is absorbed by the living plant it is first transformed into starch through the agency of protoplasm and leaf green, and then into sugar. We stop at this stage of the elaboration of plant food, because it is then, and then only, we get out honey; and we get it in greater or less quantities in proportion to the reserved store of starch. If plants had no power to store up more starch than is necessary for their immediate wants, we would have no abnormal honey flows; but they have the power to store up more of this article than they can work into tissue, and do so occasionally. It is under these circumstances we get the big honey crops if we have the working force to collect it. The excess of food over the requirements of the plant, is, while in the sugar stage, determined to the flower, or oozes through the pores of the leaf, flowing over the surface. The former is called nectar and the latter honey dew. They are substantially one and the same thing, the main difference existing in the fact that that in the flower absorbs a portion of its essential oil which gives the nectar its aroma, hence the expert can readily tell the class of flowers from which honey has been collected. Honey-dew is destitute of this aroma, but is just as healthful and nutritious as that collected from the flowers. Perhaps some of you will be ready to hold up your hands in holy horror on the promulgation of this theory, and be ready to declare me as great a heretic as those who are by some believed to be who gave to the world the pollen theory, the trowel-sting theory and the sugar honey theory. I am content to be so considered if you can disprove the statement.

Understand me, by honey-dew I do not mean the vile stuff vulgarly denominated "bug juice." That is a different thing. When honey-dew is present it is frequently devoured in large quantities by the little insect you are all familiar with. The little "beastie" is a glutton of the worst kind, and devours a great deal more than it can assimilate. The excess is voided in the form of excreta. This is "bug juice" pure and simple, and not honey dew. We are often deprived of a good crop by the presence of these creatures, and the fact that their voidings co-mingle with what would otherwise be a pure, healthy article of food.

I thank you, ladies and gentlemen, for the attentive hearing you have accorded me while giving expression to the few crude remarks I have been able to offer in the short

time allotted me. Before taking my seat I desire to thank Mr. Pringle, because it is to him, indirectly, I am indebted for what I know of the subject. It came about in this way. A few years ago, when he was President of this Association, he asked me to prepare a paper to be read at our then coming meeting, on the honey producing plants of Ontario. In acceding to his request I was led to look into a branch of natural science from the study of which I have since derived much pleasure.

Mr. PRINGLE: I am exceedingly glad that I invited Mr. McKnight to prepare the paper to which he refers. I certainly have enjoyed Mr. McKnight's address very much, and I am sure the audience has. I think it is most unfortunate that Mr. McKnight has not received a thorough scientific education. I almost envy him his ability to get up off-hand and give an address on so complex a subject as he has done to night, and it is creditable to us to have such a man amongst us.

A vote of thanks was tendered to Mr. McKnight for his able address

EXTRACTED HONEY.

Mr. R. F. HOLTERMANN: I was going to say a word in regard to a statement made here. A very full report is to go forth in regard to these proceedings, and therefore we should be careful to look into these matters in all their details, because beginners may take these as a guide. One says comb used for one season is not as good as foundation. We should be careful to point that out very carefully. Another says it makes no difference, which appears to me to be impossible. I would almost infer from one speaker that he would render his combs into wax and use foundation from year to year.

Mr. HALL: Let me say that the store comb should not be used in the brood chamber on any occasion. By not having any brood in them, the queen is not so liable to go up if she has a chance. I speak from personal experience and say you should not do so. Your extracting honey comb should be very much heavier than your brood comb. They should not be left there to be occupied by pollen. Never put drone comb into an extracting super. If you are good bee-keepers you will have very little drone comb in your brood nest. Any drone brood comb that you have will be polished just for the queen to use it. They don't know that she is a prisoner. You don't get the honey in them. If you have nice combs having cells three eighths of an inch deeper than those in your brood combs, you will have less bee bread.

Mr. CORNEIL: What is your experience in regard to their coloring the honey?

Mr. HALL: I have comb fifteen years old. They are all right if your bees don't brood in them. They don't grow black and they should not be used for any other purpose than store combs.

Mr. CORNEIL: When they are, and become black, does that have any effect on the color of the honey?

Mr. McEVOY: Yes.

Mr. MYERS: No; I have experimented on that several times, and find that there is no difference in the color of the honey. There is, I think, just a little tendency, in the dark combs, to have the bees take a little pollen there.

Mr. McEVOY: Mr. Corneil put a very important question there as to the using of dark comb—was there any difference in honey from these and new, white comb? That can be very simply tested. You will find when they are washed out that there is no difference. First divide with a division board. On one side of that division board put old combs and on the other side put the new ones. Extract the honey and put it in jars, separately. You will find that what is from the new comb is clear and what is from the other is stained, but after they are used a few times you will notice but very little difference in the color; but there is a difference.

Mr. HALL: Another advantage of the combs that are not black—you may put them in the apiary and have no trouble with moths. They can get in if they wish, as spiders do.

Mr. DARLING: With regard to Mr. Corneil's question, I think perhaps what I have seen would throw a little light on the subject. I have tried for several years to take as white a honey as possible for our agricultural show, and I have never yet succeeded in getting as good a colored honey from comb used by brood, and for that reason I have allowed them to build comb enough. As some of these gentlemen say that it does not, then I would like to know in what way they can account for it. When one, two or three sets of larvæ have been raised they darken the comb. Let such combs lie over night outside in the rain; take them in in the morning and what do you get? Something nearly the color of tea. What becomes of that coloring matter when the honey goes in?

Mr. MCEVOY: I used to pick for snow-white comb and let them build new comb. The older the comb the more the stain. Take, as I have suggested, and put in a division board and put one-half one side and the other half the other side; fill separate jars and that will convince you.

Mr. WELLS: If the comb is clean I don't think it makes any difference. As long as there is no bee-bread in it I think it is just as good as the white comb.

Mr. SHERRINGTON: I came to the conclusion some years ago that it does color the honey. I have extracted from combs that have been used and you could detect it in the flavor and color.

Mr. MYERS: If you take a comb out of the brood nest, or one that has been used in the brood nest lately, and put it up into your upper storey, and then extract out of that it will be darker. But you take a comb that has been used three or four times in the brood nest, and use that permanently, there won't be any difference. We know that the bees can put pollen into the cells, but you can take that honey out without the least stain of the pollen on the honey. Combs that have been used in the brood chamber for a certain length of time can be used as extracting combs without the least bit of injury.

Mr. HOLTERMANN: After hearing all that has been said, it appears to me that it would hardly be advisable to use these combs for extracting purposes. I have noticed just what Mr. Darling says in regard to the water.

Mr. PRINGLE: My experience is that the honey is not so good coming from old combs. It is more deteriorated in taste than in color.

Mr. PICKET: In regard to the colored water out of those combs. Is it not possible for those combs, after having been occupied for brood, that the cocoon left there by the larvæ and attached to the walls has more of less of the coloring matter. The oftener these combs are used the less coloring matter there will be left in them, as it has been taken out by the honey.

Mr. HOLTERMANN: Do the combs become lighter?

Mr. PICKET: No; not lighter in color.

Mr. CORNEIL: Mr. Darling's point is, I think, a good one. The coloring that the water takes from the comb can be very largely accounted for on the theory given by the President, Mr. Picket. If Mr. McEvoy's remark is true, and others that have been made, that the comb after being used for a few times has the coloring matter removed, why not wash them out? It may seem a difficult undertaking, but there is a way of filling the cells with water without letting air in. Combs can be washed if washing is good. I have had the theory all along that the old combs are as good as others. I have a lot of dark comb and a lot of drone comb. I like drone comb better for the supers. It is far easier throwing the honey out of them.

Mr. HALL: Too much of a temptation for the queen to go up there. I like the drone comb. I have some very dark ones.

Mr. ALPAUGH: The water will spoil the combs in a very short time. It will rot the wax. I soak mine about forty-eight hours to get the bee-bread out of them. With regard

to filling combs, if anybody wishes to do it, you can set your combs on an angle and put the water in with a dipper. The water only hurts the comb if left in too long. In regard to drone comb being used, it is all right at swarming fever. Use them on swarms and you are all right. They don't want to use them for raising drones. I have hundreds of them and use them before swarming time. With regard to the queen being attracted above, the bees want her to go up and they tease her. I have watched them, and the bees torture her. Where you use queen-bars the queens do not live so long, unless you take pains to give lots of room below. The bees torture the queen to death. They are anxious that she should go on. They will make room for her; they are dissatisfied and will nibble at her and fret her. For all that I use the queen-bars.

Mr. HALL: Through the honey flow I have had them fill up the combs that were not drone, and the patches of drone comb have been dry. Take the temptation away. Somebody here says that no practical bee-man will have much drone comb in their hives. I have a lot.

Mr. ACHES: About using these combs. I have used drone comb for twenty years. You must use an excluder, though, or the queen will go up. I would not advise you to throw away drone comb. I use it right along for extracting purposes.

WEDNESDAY MORNING SESSION.

HOW TO MAKE BEE-KEEPING IN CANADA MORE PROFITABLE.

The following paper was read by Mr. R. F. HOLTERMANN, of Brantford: Greater exercise of intelligence, greater application and greater thought applied to any calling makes it more remunerative and more profitable. In treating this subject, however, it is not my intention to deal directly with that phase of the question. The successful production of any agricultural product depends upon that which lies within the power of man, and that which is bestowed by a Divine Providence. After the recent triumphs of our bee keepers at the World's Columbian Exposition, and after the distinction which we have always won when our honey had entered into competition with the world, I need not do any more than remind Canadians that Providence has richly endowed our land with the best climate, soil and flora under which the choicest honey can be produced in paying quantities. No Canadian will wish to dispute this: none other dare deny it. Those engaged in agricultural pursuits can primarily increase the profits of their calling by decreasing the cost of production and improving the quality of their products, making them more desirable in the markets of the world. To decrease the cost of producing honey we must adopt the best known methods, and then look for still better. There is no doubt that by better methods in preparation for winter and better wintering, an immense gain can be made. At present too often queenless and enfeebled colonies are wintered. The apiary should be carefully examined, and anything of a doubtful nature in this respect destroyed. Next, instead of guessing that bees have enough for winter, and finding out when too late that they have insufficient stores, they must be examined and weighed as soon as the combs are fairly free from brood. This is generally about October 1st. Any one not able to do this should not keep bees. The capital being the same, and without much increase in labor, by proper preparation for winter and care during that season, colonies will come out of winter quarters as strong as many now are when clover blossom opens, and therefore we would be able to get in an average season fully 50 per cent more honey from our apiary.

Again, whilst the entire prevention of swarming will probably never take place, by means of room given in the hive at the proper time, shading during the middle of hot summer days, and proper ventilation, excessive swarming can be prevented, and the novice will get honey instead of an increase which too often is not in a condition to winter. The majority of bee-keepers use only one super for comb and extracted honey. This is the falsest of economy. I would sooner have less hives and more supers on them. Bee-keepers could well turn their attention more in the direction of desirable strains of bees.

More attention paid to results and less to the color of the bee would be a step in the right direction. Where would our milking and beefing breeds be unless practical utility had been kept in view in breeding? The quality of honey can be improved in various ways. In comb honey a clean section, free from travel stain, well filled, of even surface and not weighing more than 14 or 15 ounces, is desirable. A clean section can be obtained by having ventilation only from the bottom or entrance of the hive, having clean hives, and by keeping the bees close to the swarming impulse, and removing sections as soon as the harvest is over, using either a wood cover on top with $\frac{1}{4}$ inch bee space between it and the sections, or a quilt with a cushion or heavy lid to prevent the bees from raising the cushion. I prefer, however, to be free from a quilt. Even surfaced sections and sections not too heavy can be secured by means of separators and a section $4\frac{1}{4}$x$4\frac{1}{4}$, seven to the foot, or less. The day has gone by for making comb honey without separators, as it has gone by for a section any wider than above mentioned. In extracted honey we must be careful not to allow dark and light colored honey to mix. The practice of extracting honey before it is properly ripe would injure the development of our markets very much. To talk about ripening honey after taking it from the hive is impractical and visionary, and to take honey unripe and advocate such a practice only leads to having it placed upon the market unripe and stopping its consumption in many homes to which it is taken, and thus doing a great injury to bee-keepers. A well-ripened honey is a food which has already undergone the first stages towards digestion; it has also in it essential oils distilled by flowers, and whatever its source in Canada may be, it has virtues which unripe honey or other sweets can never imitate. We have all the difficulties to contend with that those engaged in other branches of agriculture have, and yet all other branches have for assistance men specially engaged in discovering the hidden secrets in their calling, making investigations which shall enable those engaged in that calling to produce better articles for less money, and to do battle with the difficulties which crop up owing to the times we live in. But not so with apiculture. Let the bee-keepers of the province and of our Dominion make their voices heard in this respect. Bee keepers are a peculiar people, and theirs is a peculiar calling. The wheat grower, the producer of almost every other crop upon the Canadian farm, is at least free from the suspicion of adulteration, but the bee-keeper, be their produce as free from adulteration as it is in Canada, has to contend with public opinion, which is ever ready, through ignorance and evil thought, to suspect wrong. We have had to fight this in the past, and have been able to do it with some degree of comfort, but recently this has become a more difficult task. Difficult, because those calling themselves bee-keepers have suggested methods of adulteration which did not even suggest themselves to the honey consumer. The method of adulteration has assumed first one guise and then another; at one time to fill unfinished sections; again to give a product to be called that untruthful name "sugar honey;" again its use is suggested to keep extracted honey from granulating when fed back; but the trail of the serpent is over it all, and if we make compromise with principle you may be sure we will suffer as bee-keepers. There is but one course—the honest, uncompromising bee-keeper must show himself to the public as in no way countenancing such a fraud. To him such a suggestion must be a crime against morality. He must show that in no way he will support such an idea or support a man, be he king or peasant, who has lost all sense of right to such an extent as to refuse to see the evil of such a suggestion. Failing this, he must have the stigma rest upon him; that is, he openly supports or secretly winks at and supports adulteration, and, as soon as Canadian bee-keepers do this they must say good-bye not only to an enlarged home market but a large proportion of the market they now have, and they must also say good-bye to the foreign market within their reach. There are only two paths—the honorable and upright, yet uncompromising, the one which will lead our bee-keepers and our nation still higher in the moral scale, or the reverse. Our markets are peculiarly interesting to bee-keepers. Anything influencing them for weal or woe must increase or diminish the profits to be derived from the apiary. It will not be wise to here mention the lowest figure at which first-class honey has changed hands during the last few years, but I am safe in saying that there are numbers of bee-keepers who would be willing to sell their crop in bulk, free of all expense, at 6 cents per pound cash. As the methods of production improve, or in other words as the cost of production decreases, and through experience the risks are lessened in any

calling, competition must reduce the price. Yet, aside from this, the uncertainty of a market has tended to depreciate the value of honey in Canada. Those selling have been beaten down in price, often through misrepresentation as to what others were selling at. If there was a standing offer of six cents per pound net for our surplus honey it would be a great relief to our country. Before touching upon foreign markets let me say that I feel that our home market is not developed as it could be by united effort on our part to produce a well ripened honey, and bringing honey more prominently before the public. I could not help thinking, when Prof. Robertson was delivering a lecture upon the value of cheese and butter as a food, how much good could be done for bee keepers by placing the value of honey as a food before the public. Could we not do good by uniting more in bringing this matter before our country? Next, we allow too small a margin to the retailer. Ten cents per pound is not too much for honey; in fact the price is low. If any cutting has to be done let us allow the retailer more; this will be a step in the right direction. I have, during the past year, paid special attention to the foreign markets. Dr. Montague, M.P. for Haldimand, finds the imports of honey to Great Britain about ten million pounds per year. We, during 1892, exported to Great Britain only 10,860 pounds, and less than 17,000 pounds to all countries, and imported 28,699 pounds. This latter was brought in at British Columbia. After urging the Government to do something to assist bee keepers in opening a foreign market, and reminding them that Ontario contained over 10,000 bee-keepers, they secured for me particulars in connection with the British market, and I have a promise that if the Experimental Dairy products are again shipped to Europe, a trial shipment under Government auspices will also be made of Canadian honey. Also that when Prof. Robertson goes to Europe he will not only endeavor to secure an opening for our honey, but draw attention throughout Britain to Canadian honey. Also the Government are going to see what they can do with our honey in Germany. In recent correspondence with the Department of Trade and Commerce, they gave the prices realized on honey from various countries. There are also the names of firms, no doubt of the highest standing. They are herewith appended, and should any of you feel inclined in the meantime to enter into correspondence with them direct, you can do so. I know of a number of small shipments of Canadian honey this season netting seven cents per pound. Buckwheat honey sells there to good advantage, netting nearly seven cents per pound. Messrs. C. A. Slater & Co., of 19 Old Hall St., Liverpool, England, wish to correspond with those having Canadian honey. Messrs. Cross & Blackwell, (Ltd.,) of Soho Square, London, England, say, "We have no knowledge of the value of honey from Canada. There is considerable demand in this country for pure honey which comes from France, Italy, South America and the West Indies. It varies in price according to color and flavor from 28 to 68 per cwt. That is 6 cents to 11½ cents per pound." The High Commissioner, London, England, says, "I also communicated with several other firms with the object of obtaining further and more detailed information, and to a large extent was unsuccessful." Owing to Canadian honey not being known on that market, no sufficient quantity having been sent there apparently to create for it a distinctive name. Messrs. Wurzburg & Co., of 4 Fenchurch Building, E.C. London, England, write, "In reply to your enquiry as regards honey, we beg to say that there is always a certain sale for honey in this market and at Liverpool, but a ready sale depends very much on the quantities on the spot and on the quality of the lots offering. At the present moment a consignment of 500 cases containing each two cans of 56 lb. could be disposed of at about 7½ cents per pound. The prices vary much, not only according to the quality of the honey but according to the fluctuations of market, from six and three-quarters to nine and three-quarters per pound. We receive consignments here from New Zealand, Australia, Chili and California, the latter being the most appreciated on account of its finer flavor. White honey or very light amber honey is always preferred to amber or dark amber. The best way to consign it is in cases containing two cans of 56 lb. each, making one cwt. net. We are handling consignments ourselves, and will be very glad to communicate with your friends direct. Cans must be carefully soldered and put in strong boxes, otherwise there is leakage, which involves heavy loss. Sometimes we receive consignments of honey in cans containing 45 one pound tins (about the size of condensed milk cans) but these are difficult to sell.

Messrs. H. & T. Walker, of 41 Eastcheap E.C., London, England, say there is always a certain demand for honey in Great Britain. It comes principally from Chili, Australia, California, France. Chilian and Australian ranges from 5½ to 6 cents; for California, 6½ to 6⅞ cents. Honey from Narbonne has lately brought 9 cents to 12 cents. This latter honey is packed in 56 pound tins. This firm charges two per cent. commission. Messrs. Walker do not desire small packages. Messrs. Hodder & Co., Bristol, England, buy Chilian and Californian honey in kegs at 7½. Messrs. Gedye & Son, Bristol, England, deal in California honey. Price depends on quality, varying from 7 to 15 cents per pound. Messrs. Warren, wholesale druggists, Bristol, England, also purchase honey in barrels. The stated prices vary "enormously," according to quality and color. They advised addressing editor of the *Public Ledger*, 8 St. Dustain's Passage, Great Tower. St., London, for more information. In closing, the letter from the High Commissioner's office states: "My impression is that this honey question is an important one, and that a good trade may be done in the article." Again the High Commissioner refers to adulterated honey which comes to the European markets, and specially mentions that honey from parts of the United States has been sent adulterated, and it still has more or less suspicion, resting upon it. It is extremely important that our product shall have a reputation for purity.

We produce honey the choicest, and the present indications certainly go to show that our honey, when it has won a place and reputation in the European markets, will net us 7 cents per pound. It is therefore a question of the deepest importance to our bee-keepers and to our country. Our markets at home and abroad, closer attention to details, greater perfection in production, are important factors in increasing the profits from bee-keeping.

Mr. D. Chalmers: There is one point in the paper that I do not quite agree with, and that is in regard to taking honey from the bees before it is ripe. I suppose we may understand Mr. Holtermann to say that the honey must be capped over I do not advise anything different, but I contend that we can ripen honey under all circumstances when bees can. If we have a flow of honey, and should strike a cold spell and the bees not be able to keep that honey warm, it will naturally thin. With that honey under our care we could put it in a warm room and ripen it. The capping of honey is no proof that that honey is ripe. I contend that uncapped honey is just as liable to be ripe as capped honey. Capped honey in the hands of an inexperienced person can be spoiled, while uncapped, in the hands of an experienced person can be ripened. I have honey now in my possession that would compare favorably with any ripened by the bees. I took these sections when the honey flow stopped and placed them in a room, and it ripened right along, and to-day it is in splendid shape, and, as far as flavor is concerned, it is good. If my word goes for anything, the honey that I showed at Chicago and was successful with was mostly uncapped honey. I took it from the bees and placed it in a room and ripened it.

Mr. Holtermann: In what state was it? Was it ready to cap?

Mr. Chalmers: There was very little capped at the top of the comb. Bees only cap honey because they have no room for a deeper cell. Honey is ripe when it is capped, but I contend that uncapped is just as ripe as capped. In referring to this success at Chicago, we all take Mr. Pringle as an authority, and, as near as I can remember, in his report he said that a certain individual in sampling this honey that I showed, pronounced it the best flavored honey he had ever tasted.

Mr. Pettit: Were the cells full and did they seem to shine when you raised it up? I refer to this honey that you sent to the exposition.

Mr. Chalmers: The honey was all shining, but I could not say whether the cells were full or not. The honey is concave in the cells. There is a certain part of the cell at the mouth that must be empty.

Mr. Pettit: There is a time always when those cells are as full as the bees fill them?

Mr. CHALMERS: I answer in this way. I won't believe that bees cap honey unless there is something that touches their backs and compels them to it. They certainly would have added as long as they had room.

Mr. PETTIT: Would they have added any more to the filling of the cells, or would the very next thing be to cap them?

Mr. CHALMERS: By the lower part of the comb there was no appearance that the bees had any intention of capping.

Mr. McEVOY: He showed me this honey sent to Chicago. It was thistle, and it was just about the finest thistle honey I ever saw. That honey, although it was not sealed, was ripe. What I tasted was ripe. It might have been filled just ready to seal. From the flavor that honey was ripe. Mr. Chalmers had a cake there. That honey, in his particular case, was pretty nearly perfect. I am an advocate for capping, as a general practice. Honey, as a rule, when unsealed, has never that heavy, smooth fine flavor.

Mr. HALL: I can answer Mr. Pettit's question. We had a ten days' flow of honey, and any honey that was in those combs was ripe. We all know what can be done in ten days. It came in from the field ripe.

Mr. CORNELL: I want to say in the first place that the nectar in the flowers is not always of the same density. To show how thick it is sometimes, in 1883, the year in which we had such a long continued honey flow, we extracted our hives each alternate day. We commenced in the morning, and we went around the yard in the same direction, so that we came to each hive about the same hour at each extracting. We got large yields, as often as that. I had one hive that put up 37 pounds in 48 hours. There was not a capped cell in the whole super. I took a jar of that honey and cooled it down to 60° to make a test. It was then fit to put on the market. That honey ran between 13½ and 14 pounds to the gallon. There was no capping about it. It is not necessary to allow honey to become capped in order to ripen it. The writer of the paper condemns ripening honey artificially. It is being done. Some of the very best honey on the market is ripened in this way. I ripen my honey in three large tanks. This year I have already sold somewhere about 5,000 pounds, and I have been enquiring as to what prices some of the gentlemen here are getting for their honey. So far as I can find out, I have sold at as good a price on the average as others here present. That is how artificially ripened honey sells in competition with other honey. All capped honey is not of the same density. Bees will cap honey sometimes thinner than it is capped at other times. You can't depend upon having honey at a standard density by having it simply capped.

Mr HOLTERMANN: I can agree with every statement that has been made since I took my seat, with the exception of one, that is this: It is injurious to advocate taking honey unripe and afterwards evaporating it. There may be a few individuals who ripen their honey afterwards. They are few, and I would like Mr. Cornell to give us a few names of those who are doing that, and we can give names of a great many who are injuring themselves and our market by putting the honey upon the market not sufficiently ripe. Now, in reference to the statement that all honey capped varies in its specific gravity. Under the conditions generally found, the honey which is not capped is of a lighter gravity, and is not as good a product as that which is. We injure ourselves by putting on the market a product which is not ripe. When this unripe honey goes upon the table of the consumer and he does not like it, we lose our market.

Mr. ACHES: I agree with Mr. Holtermann. I heard a good deal about this in 1881, when Mr. Jones advocated this process. Mr. Jones, it appears to me, did not make a success of the business. Mr. Chalmers, was yours wholly artificially ripened or naturally ripened?

Mr. CHALMERS: Partly artificially.

Mr. ACHES: Is it profitable? Do you advocate it? It may be done, but only one out of twenty are successful.

Mr. CHALMERS: No; I don't think the Convention thinks I advocate it.

Mr. Aches : Mr. Corneil made the remark that he had sold about 4,000 pounds and got a good price. I sold a lot, too. I have a few left. It went to the Northwest, and I realized eleven cents for that. The commission man took it right from me at eight cents for the extracted.

Mr. Holtermann : There is one thing to be remembered. I will go so far as to admit this, that it is better to sell the honey well ripened artificially than to put it upon the market unripe. There are some men who put this thin honey on the market. They are trampling on the toes of men who have riper. The idea we wish to go forth is that it is desirable to have well ripened honey on the market.

Mr. Pringle : There is very little difference of opinion on this question. I think we all admit that it is unwise to put unripe honey on the market ; whether it has been capped or not, that is not it. We also admit, I think, that honey that is capped is not necessarily ripe. I have opened some honey that has been capped for some time and found it much thinner than honey that has been extracted before it was ripe at all None of you will deny that, so that I agree with nearly all that is in the paper ; but when Mr. Holtermann makes the remark in his paper that the idea that honey can be ripened artificially is imaginary and unworthy of attention, I am not surprised that anyone should object to that. We can ripen honey artificially. We can extract honey before it is capped, and have a first-class article.

Mr Pettit : The question I wish to ask is this : Is the discussion we are now having going to be reported ? If it is we expect it to be educating Do you wish it to go out that we are quite willing that bee-keepers, as a rule, should ripen honey artificially, but under existing circumstances wait until the honey was capped ?

Mr. Pringle : I certainly advise all to let their honey be capped before it is extracted. It would be a great evil to the honey industry in Canada for bee-men to extract generally until the honey was capped. I do not advocate honey being extracted until it is capped. The thing is possible to ripen it artificially and have a first-class article.

Mr. Aches : They will gather from this that they can get twice the amount of honey by extracting it before it is ripe. Honey will go down. It is less trouble to do that.

Mr. McKnight : It is a question that affects the bee-keeping industry to a considerable degree. I have practised what is known as artificially ripening honey when I deemed that was necessary ; when I wished to bring my product up to a standard that I thought should be attained. Mr. Holtermann makes the broad statement that he believes that the artificial ripening of honey has a tendency to injure its quality. That is a broad statement, but it is also a bald one. If Mr. Holtermann would instruct us how honey was deteriorated, it would be worth recording. I believe that the process of bringing up a lower grade of honey to the standard degree of excellence is right. It injures it no more than if it were left in the hive until it was ripened.

Mr. Corneil : I believe that all agree that it is not proper to put unripe honey on the market. The question on which we do not agree is as to how we are to get it ripened. Mr. Holtermann advocated having it all ripe. Then the sentiment of the Convention is, that to get it all ripe we must get it all sealed. If we could educate small bee-keepers to do that, I would be content. The honey would be better fitted for the market. Take a farmer. He finds the supers all getting pretty full. He extracts the honey ripe or unripe, when he can find time. All the combs will be unsealed, or a piece around the top will be sealed. The lately gathered honey will be around the bottom, and there will be a lot of raw nectar. That is extracted and thrown all together. There is a lot of fermented honey that is put on the market that I think becomes fermented just in this way If we take the other course and try to educate the people to put it in some open vessel, I believe the general result would be better than to try to induce everyone to leave the combs until they are all capped.

Mr. Aches : Would not that be injurious ?

Mr. Corneil : No.

Mr. Aches: When is it ripe?

Mr. Pringle: Mr. Holtermann does not say that it ought to be extracted when it is capped, but when it is ripe. If the expert does not know when it is ripe, how are we to expect the amateur to know?

Mr. McEvoy: When it is thin it is not ripe. Leave it and extract about twice in the season. What is not sealed will be ripened by the long heat of the summer.

Mr. Hall: It is true very often that capped honey is not ripe, but I would say, don't extract your honey until it is capped.

Mr. Chalmers: I do not wish it to be understood that I advocate taking honey from the hive before it is ripe. I simply stated that under certain circumstances we can ripen honey artificially better than the bees can ripen it.

Mr. Hall: That is a dangerous thing to say.

Mr. Chalmers: Another point we can make is this. In Mr. Switzer's paper yesterday he stated that there was a variance between the clover and linden flow. The clover will go very much into the linden. I have a heavy flow of clover at the time the linden opens. If you want to get a distinct flavor of basswood for extracted honey you can remove your honey at the close this particular flow starts. You can remove your crates.

Mr. Pettit: I quite understand Mr. Pringle's position, but I would steer the Association clear of it. I fully endorse the idea of leaving it to the expert. We will never suffer from taking that course. There is another thing. The impression has gone out from what has been said here, that you are going to get a lot more honey by shaking your honey out given. That is a mistake. If you have the necessary implements and if the bee-keeper has the necessary combs, run up. If you give the bees plenty of room, there are bee-keepers who do the capping, who do not go to the field at all, and these bees can just as well be employed capping as doing nothing. Bees are very much like human beings. They cannot be satisfied. There is not a millionaire on the face of the earth that is satisfied. If you give bees a ton of honey, they want another ton. The safest thing this Association can do, under the circumstances, is to keep ready to let the bees cap. We never claim that our linden honey is pure linden honey. We only say that it is sufficiently so to give it a distinct flavor. When the linden flow begins, take all the clover honey that is ready to go away, and if there is some that is not ready to go away just let it go with the linden. You are perfectly justified in saying it is linden honey. You do not claim that it is wholly linden. If you are on the idea of shaking out your papers every time, you must have green honey. Unfortunately the great majority of consumers is not careful.

Mr. Chalmers: You say that you want your honey all capped, but how are you going to get it all capped, should the honey flow cease?

Mr. Pettit: I admit such a time comes at the close of the flow, and as a rule just when the flow ceases the bees cease. There are a few bees who go on and work, but the great majority quit. If the weather is warm and dry, just leave it a little while and it will come out thick enough, and it will be just as safe with the bees as anywhere.

Mr. Corneil: It is not true that the bee-keeper who ripens it artificially will have more honey to sell, because in the artificial ripening he evaporates the water.

Mr. Wells: I think it is a wrong idea to teach people to extract honey before it is ripe. I have seen extracted honey at the Toronto Fair that was sour. I have known men to follow that teaching, and then had sour honey. It is a bad practice to advocate taking it out before it is ripe.

Mr. Deadman: About ten miles from my place was a man who kept quite a number of bees and shipped his honey to Montreal. He came to me one time saying he had honey in Montreal that he could not get rid of. I said, "What is the trouble?" He said, "I don't know." I said, "What will you take for it?" He said, "Whatever it is worth." I said, "I will give you six cents for your honey, freight paid, if you will send it down." I was to pay the freight and deduct it from the price. That honey came to me in kegs. It was fermented. To get that honey out of the keg I had to take the

head off. The inside of that honey was granulated and the rest was a thin, sour liquid. I made up my mind he had extracted it green. He is not keeping bees or selling honey now. A brother of his came to my place and he had a sample of honey with him that was very white and clear and tasted finely of the clover, and, although the honey was thin, I bought and sold it again to some parties who wanted honey. They told me afterwards they preferred the dark honey to it, as it had a rather sharp flavor. I could not sell it, so mixed it with my own. I didn't know what was the matter with the honey, but I was told afterwards that he extracted his honey every three days. He took his honey too green. It was not ripe. I stored up my hives last season and did not extract the honey until the end of the fall. When I extracted it at 70° it weighed over 14½ pounds to the gallon. Those who extract their honey before it is ripe, ruin the market for those who put a good article there.

Mr. Myers: Let every bee-keeper in the land see that his honey is ripe before he puts it on the market. I agree with Mr. Holtermann in regard to capping the honey. I would like just here to move a vote of thanks to Mr. Holtermann for his very excellent paper. Seconded by Mr. Aches and carried.

Mr. Holtermann: The discussion has gone on in a very nice spirit. I said in my address that I thought it was impractical and visionary to talk about ripening honey after taking it from the hive. Are the bees not the ones who can do it at the least expense? In reference to the combs, it is too common using only one extracting super. When the average bee-keeper uses more, we will have less of this putting of unripe honey on the market.

Reports of Affiliated Societies.

Moved by Mr. McKnight and seconded by Mr. Pringle, that the reports of affiliated societies be taken as read, except where there is reason to believe that they have not adhered strictly to the regulations. Carried.

NEW BUSINESS.

Mr. Corneil suggests that the time for affiliated associations joining be extended for a month.

Mr. Hall moves that the time for affiliated associations joining be extended from the 1st of May to the 1st of June.

Mr. Sherrington: I think the 1st of May late enough.

Mr. Meyers: I second Mr. Hall's motion. It is only in May that we get rightly pulled together, when we are pretty sure our bees are going to make us a return.

Mr. Sherrington: If we left it till the spring we would never get a meeting at all.

Mr. Brown: I consider that extending the time is injurious. If you give an inch you generally have to give a foot. Curtail the time, and say January 1st instead of June 1st. The most of the affiliated associations hold their meeting in November or December, consequently they are then ending up the year's business. Is not that the proper time to wind up the year's business, or at the beginning of the new year?

Mr. Couse: I think it quite necessary to extend the time. Have it January 1st and you will find that none of the associations will join at all. You would find that 13 associations have not 65 members, consequently they could not affiliate before they had the members. There are a great many who do not join until May. A great many do not join until after the circulars are sent out. Previous to that they have not got the members. I do not think you can do it earlier than that.

Mr. Cornell: If I were president of a local association I would say we had better not affiliate so early, because if we don't get a grant we will be $5 out of pocket.

Mr. HUTCHINSON: There is one difficulty. They can be only one object in extending the time to the 1st of June. If we are going to be so much longer before we get the grant, there is going to be the trouble. Our local associations were in debt right along until we got the grant. Could we not extend the time to the 1st June to satisfy them and get our money a little quicker than we have in the past?

Mr. ECKERT: You will get the grant as soon as the Government grant comes in. It won't make it any later. We write to the Secretary [illegible] the 15.

Mr. MCKENNEY: It strikes me that a question of a month can do no harm, and it may do some good. It has been explained now that the date did not determine the time of getting the Government grant.

Moved by Mr. HALE, and seconded by Mr. MORRIS, that the time for affiliated associations joining be extended from the 1st of May until the 1st of June; that the words of By-law number 12 be amended so as to read "1st June" instead of "1st May." Carried.

THE DELEGATION TO OTTAWA.

Mr. PETTIT reported as follows: We went to Ottawa as you are aware, under the direction of The Ontario Bee Keepers' Association, as delegates. We made known our business to some of the members: Mr. Carpenter, Mr. Taylor and a number of others, and they very readily consented to come at once with us to see the Minister of Agriculture. A number went with us. We were introduced and received most cordially and given a patient hearing. We attempted, as best we could, after telling our business, to impress upon the Minister the necessity of this legislation. I can't begin to go over all we said. We urged the importance of bee-keeping, first, to the country. We urged that there was a very large quantity of a valuable product of nature going to waste, that if gathered would add to the exports of the country and the comfort of the people. We argued that it would add to the wealth of the country, without displacing anything else. This was a point that we impressed particularly. If you undertake the production of horses, poultry or any farm product, it must of necessity remove something else to get room for the new interest. Not so with bee keeping. It could be set down in almost any township and become a profitable business. We also advocated that it was necessary in order to get foreign markets that we produce a much larger quantity than we do now. I learned when I was in England that we must produce much more largely than we do now, if we hope to get a market. We attempted to show them that one of the very best things our Association thought well to do was to give us a pure honey bill; such a bill as would be a terror to evil doers. Such a bill would be what would give confidence to our own people and foreigners, knowing that Canada had made it impossible to put anything on the market but a pure article—would open their markets to our product. We ought not only to produce and put on the market a pure article in honey, but in everything. The people were anxious that we should, and that the law should be so severe and the penalty so heavy that it would be observed. The Minister agreed. He seemed to think the penalties rather high. Dairymen obtained a bill for the very same thing as we want. There is no butterine made, imported or sold in Canada. If that bill was given, and we know it was given, then why not ours? If you go to a hotel and sit down to eat a meal you don't taste the butter thinking it is something else. You take it as butter. If you can do the same with honey, you can realize how it would incr[illegible] its sale at home and elsewhere too. Our people are suspicious of the purity of our honey, and many things have been said and written to make the people believe that the honey is not pure, and if we had such legislation as we ask for, it would remove that doubt. They did not concede that point. The Minister said, however, that he would refer the whole matter to Mr. Saunders. We had a personal talk with him. We thought it our right and our business to do so, and instruct him. If you go to Ottawa asking for a bridge or a canal, they understand you at once, but when you talk about bee keeping you have to educate them right up. There is difficulty in getting this legislation that the butter-maker did not

have. Thousands of people all over the country may adulterate honey, but they can't adulterate butter, hence the necessity of having a law that has penalties attached. I have had more or less correspondence with the Minister of Agriculture, and the Government have all yielded the point to give us a pure honey bill. So that sugar honey is not to be allowed to be manufactured in the country. They have also admitted the penalties, and say that if these same penalties were granted dairymen we can see no reason for withholding them from bee-keepers. That place is just flooded with deputations. At first it seemed very up-hill work. We stayed there and stayed there, however. We said that we would stay there until next June, until finally they did seem to think there must be something in what we wanted. We stated that a great many of our best bee-keepers' industry would be destroyed if we did not get this legislation. They felt that they must give up their business and earn their living in some other way. When things seemed to go slow, I said "I will stir up the manufactures." I telegraphed to all the leading firms in Canada and I asked them if they thought it in their interests, to write to the Government. They did do so. I saw so soon as these replies reached the Government and the members, there was a good deal more of yielding. That was a stroke of policy on our part. There is another way we reached these men, that is by talking to them personally. We went to see the Finance Minister and then we went to see the leader of the Opposition, Mr. Laurier. I informed Sir John Thompson that we did not want them to criticise the bill; we wanted them to assist. When we had a good point or a good many good points, we got them type-written and sent them to the members. We struck off some of the proposed bills and sent them to the members too. Now, we think that we are in a fair way to get the bill, but we have the opinion of members on both sides that the matter will need urging; will need watching and pushing. I am very thankful for the patient hearing, and am now prepared to answer any questions.

Mr. McKNIGHT: About all that is left to do is to tender our thanks to our delegates for the very able way in which they presented the matter to the Government. I think for that the reception they received—all things considered—reflects to our credit. I was opposed to it last year, and am still opposed to it. I prophesied at that time that they would not succeed and they did not. I would extend that prophecy and say that it will be some time before they get their bill passed in the form that they propose it, and if passed in any less stringent form, it will be no better than the laws we now have. I have very much pleasure in moving a vote of thanks.

Mr. HALL: Before that is settled I would like to ask Mr. Pettit a question. Did those gentlemen take any special interest in finding out, do you know, the extent of the production of honey in Canada?

Mr PETTIT: I made an estimate and sent it to them by mail, and then we asked for the Government returns. The Government took up all those things. That particular part was not finished, but they hastily gave us an estimate of the production of the honey in Canada. The year was the worst we have known. We sent them another document afterwards to show them the reason why our estimate of the present year was greater than theirs. We showed them that increase of stock and the difference in the honey take would make the total considerably above that. They were very anxious to find out all the figures necessary.

Mr. HALL: I may say that I feel a very great interest in the delegation and am sorry that one of them is at home from sickness. I am very much pleased to receive such a report, and to see that these gentlemen have done what they were sent to do. I was under the impression that they would accomplish it. I have met one man. He is on the Opposition. He said, "The bill will pass, but you must watch it through." I join with Mr. McKnight in tendering our thanks to Mr. Darling, Mr. Frith, Mr. Pettit and those who volunteered, Mr. Brown and Mr. Holmes, to give them our hearty thanks for what they have accomplished. Carried.

Mr. HOLTERMANN: I saw Mr. Sutherland also at Oxford, and saw Dr. Montague, and so far as I can find out, there is not one bit of objection to this bill being carried through in the interest of our home and foreign markets. I would therefore move that

this Committee be appointed to carry on this legislation, and take whatever steps they see fit to carry on this matter. Mr. McEvoy seconded the motion.

Mr. McKNIGHT: I regret very much that this matter has been introduced, for the reason that it is going to prolong the time taken by this meeting, and not profitably. I opposed the motion last year and gave what I thought good and substantial reasons for so doing. I regret its introduction, but I do not wish here and now to enter on the subject. I am quite sure the resolution will carry. Most of those who supported it last year are here and will support it again, therefore I only [illegible] in trying to prevent it being passed.

Mr. HOLTERMANN: What are the funds of The Ontario Bee-Keepers' Association for?

Mr. McKNIGHT: Not to squander foolishly.

Mr. HOLTERMANN: In what way can we find a better way than to spend what money is necessary in the way we propose?

APICULTURE AT THE WORLD'S FAIR.

By ALLEN PRINGLE, Selby.

As I had the honor and responsibility of representing the bee-keepers of Ontario at the Columbian Exposition at Chicago the past season, I have deemed it a duty as well as a pleasure to be here on this occasion (at considerable inconvenience) to respond to the request of the worthy Secretary of this Association by giving some official account of my stewardship, and, at the same time, some account of bee culture in general as presented at the World's Fair.

Where there is so much to say or write, it is a difficult matter to get down the gist of things into a paper of suitable length for an occasion of this kind. While the magnitude of the greatest of expositions would have rendered, not days, or weeks or months, but years necessary for an examination of its vast stores in detail, the Department of Apiculture, though comparatively not large, was considered by itself and combining the comparative youth as a science, very creditably represented by the apiarists world at the World's Fair. Twenty foreign countries, (including Australasia) and seventeen States and Territories of the American Union made apiarian exhibits in Jackson Park. These were, Canada, Great Britain, Russia, Germany, Italy, Spain, Greece, Ceylon, the Ottoman Empire, Siam, Australia, Costa Rica, Trinidad, Hayti, Mexico, Brazil, Ecuador, the Argentine Republic, Venezuela and the seventeen American States. Of course many of these exhibited but a small quantity of honey and appliances. Among those which exhibited larger quantities were the States of New York and Illinois, the Province of Ontario, Great Britain, Ohio, Michigan and three or four other States. While the basis of the world's apiarian exhibit was concentrated in the East Gallery of the Agricultural Building in Jackson Park, the balance was scattered through the various buildings being for the most part in different sections of the Agricultural Building.

When I say that Ontario came out ahead of all competitors at that great World's Fair in the matter of honey, as well as in many other directions, I say what makes every Ontario apiarist proud of his province and of the honor and skill he has brought to bear on his favorite pursuit. And when another fact (which everybody now knows) is stated, viz: That this same province, to mention language fairly "translated the dark" of the world in the matter of butter and cheese, especially the latter, nobody will venture after this to deny that Ontario is "in it" as a land "flowing with milk and honey," of the very best quality. And that is not all. Canadian wheat was also "in it" at Chicago. And here we have bread and cheese and bread and honey to offer the world instead of lifeless as well as the sweetness and luxury of life.

The bread that gives life
And the cheese that gives strength
And the sweetness and luxury of life
Will need honey and good wife
And make home a paradise
For parents and every child besides

As you doubtless already know, Ontario took seventeen apiarian awards: Two provincial awards on the collective exhibit of extracted, and comb and extracted honey, and fifteen individual awards, as follows: The Gould, Shapley & Muir Co., Brantford, award on comb honey of 1892, award on comb honey of 1893, award on honey extractor, and award on brood foundation; R. McKnight, Owen Sound, award on linden extracted honey; J. B. Hall, Woodstock, award on clover comb honey of 1892, and award on clover comb honey of 1893; D. Chalmers, Poole, award on thistle extracted honey granulated; Abner Pickett, Nassagaweya, award on linden extracted honey; J. B. Aches, Poplar Hill, award on clover comb honey; A. E. Sherrington, Wakerton, award on linden extracted honey; J. Newton, Thamesford, award on clover comb honey; S. Corneil, Lindsay, award on clover comb honey; Geo. Wood, Monticello award on linden extracted honey; Geo. Harris & Son, Dungannon, award on clover extracted honey; Allen Pringle, Selby, representing the Province of Ontario, award on collective exhibit of extracted honey, and award on collective exhibit of comb and extracted honey.

This number of awards is more than twice as many as that taken by any State in the Union, or any other foreign country. In fact it is more than all other foreign awards combined. And that Ontario did not receive a still greater number of awards was not because we had not other individual exhibits of honey superior to foreign exhibits which received awards. I think no competent and impartial judge could examine some of those foreign exhibits of honey which received awards and compare them with some of ours which did not receive awards, without admitting that ours were greatly superior. This is no impeachment of the judge, who, I think was both competent and conscientious, and the jurors no doubt did what to them seemed right and proper. To make the matter plain, let us suppose, for instance, that here is a province or foreign state with, say, thirty honey exhibits recommended by the judge for awards; and here are also several other foreign states with one exhibit each or two recommended by the judge for awards, but marked no higher in points of merit by him than the lowest ones of the large number, The jurors, in dropping out some of these recommendations would quite naturally drop from the large number instead of the small ones, for in dropping from the small even one, they would be dropping all, so far as that particular country was concerned seeing that there was but the one recommendation for an award. Hence it is that while there were fifteen individual awards made to Ontario, there were at least a dozen more individual exhibits of honey of excellent quality in our collection and equally as good, to say the least, as other foreign exhibits which received awards. There was no honey at the Fair outside that from a few of the American States that was at all equal in quality to the Ontario honey, with the single exception of that from England and Scotland. The producers no doubt thought it was excellent, but you ought to taste it. Australia, during a honey season of about nine months, produces honey in such quantities and abundance as calculated to excite the envy of some of our western Ontario friends, who only enjoy a honey season of a few weeks' duration, but they need not be envious. What they do get from the linden and clover and thistle is worth eating when they get it; and, compared with the Eucalyptus and other gum honeys of Australia, the West Indies and other tropical countries, it is far away head of them all in color and appearance, as well as taste. I exchanged samples of honey to bring here for your inspection, with many of these foreign countries; but not without great difficulty on account of the confounded customs, for, technically, not even an ounce of this foreign honey "in bond" could be exchanged for another ounce till released from "bond." Some of the foreigners would venture an exchange of samples, while others, having the fear of Uncle Sam before their eyes, would hardly part with a grain or two for a taste. As for myself, I was fortunately relieved from this species of bondage the whole season, as I had in the spring succeeded with much trouble and many arguments in inducing Uncle Sam to accept the duty on twenty gallons of the honey, all of which had, of course, been entered and brought in for exhibition till the Fair was over and not for consumption. Concurrently with the release of the twenty gallons from "bond" was this deponent released from bondage, and he was thus free to sample, exchange samples, sweeten up friends and even enemies (and this is a wise thing to do sometimes) give away, sell, or do anything else with the nectar so long as he kept fairly and reasonably and conscientiously within the twenty gallons. Of

First you must make what in tariff schedule is called an "entry." And to make an entry you must employ a "broker"—a customs' broker of course—and you must pay the broker, and pay him from three to five dollars every time, even though the article you are "entering" be worth only fifty cents. Then some numerous blanks and forms to be made out in duplicate, or triplicate, and you must swear and sign. (The other swearing is not done on paper as it might not look well in black and white), and sign and swear to this and that about the article in "bond" which you are making an apparently hopeless attempt to get out of "bond." Finally, the entry for "consumption" is made, (and, mind you, whether the thing is a plow or a jug, or tenpenny nails, or a mushroom, or a cake of beeswax, it makes no sort of difference, they are one and all for "consumption.") This is stage No. 1. Then this entry (including, however, but two out kind of swearing, the other for a wonder they don't seem to get in bond), must be taken to an "appraiser," who takes his own time to get around to appraise the article in "bond." He appraises it, and in doing so if he thinks you have not appraised it quite high enough yourself, he comes to your assistance to raise it a little higher. This appraiser may know about as much of the particular article he is appraising as he does about Jove or the centre of the earth, but thinks that's nothing; what he doesn't know he guesses at, and never once guesses too low. That is stage No. 2. Then the papers must be taken to the "valuator" for his manipulation, which may cover a day, or two days or may be ten. That is stage No. 3. Then they must go to the "liquidator." What he does to them is a mystery too deep for me to make out, for he is not even yet ready for the "duty." However, he does something to them, or nothing as the case may be, and after he is finished his labors (?) on them, stage No. 4 would appear to be complete. Then the papers must come back to the "appraiser" or "broker" who makes them ready for the "collector," stating the amount of duty to be paid. But none of them will receive duty. That must be paid away up in the city, nearly ten miles off. Finally you find the man in the city who is ready for the money; you give it to him and he charges you twenty cents for taking it. This is a fact and no joke, and it is the only case of the kind I know of in the whole realm of commerce and finance where a man takes your money for nothing and charges you for taking it. The agony is at last over just as the proceedings are becoming curiously interesting; and one goes off with his ideas of political science badly rattled, and hardly knowing whether to laugh and start off for the "Midway Plaisance," or damn the whole business. He probably does both till his equilibrium is properly restored. He can then go and sell his goods if he wants to, after having paid the customs cormorants in some cases more than half the commercial value of the goods.

The last thing I put through this custom mill, with the above experience, was a honey extractor belonging to an exhibitor and which was to remain in Uncle Sam's dominions. Having been through twice before with one of the aforesaid "brokers" at my back each time, I determined this time to be my own "broker," but before I got through the "broker" before you was strongly impressed that he probably had "a tool for his client." He got through, however, all right, but not without sweetening this official and that one with sundry bottles of honey, amounting to about half the broker's fee—thus saving the other half. Notwithstanding this saving, the customs' charges on that honey extra

ter were more than half what the article was commercially worth. You may get through that round with the customs in one week and it may take you off and on, two, or three or a month. In all I had three of these rounds to make in Jackson Park. One in the spring, clearing that dubious twenty gallons, another at the close of the Exposition, clearing the whole of the balance to be sold, and that last round with the honey extractor. The United States Government imposes a specific duty of twenty cents per gallon on imported honey; but what with their wine measure and their peculiar arithmetic in converting pounds into gallons and sections into gallons, they get from two to three cents a pound.

As to the prospects of that market for a portion of our coming surplus of honey in Ontario I think they would be excellent, were it not for the heavy duty. But as the so-called "Wilson Bill" proposes to reduce the duty on honey fifty per cent, the prospect, in the event of that being done, would certainly be bright. With all the duty, I succeeded as the exhibitors know, in netting them for their honey 7 to 8½ cents for extracted and 13 cents to 14 for comb. Free of duty, it would have netted them about 9 to 11 cents for extracted and 15 to 17 cents for comb, at least. And, as the next sale of Canadian honey in Chicago would be at an advance on this one, assuming a reduction of fifty per cent in the duty, and allowing for transportation thence, it would net in my opinion 9 to 10 for extracted and 15 to 16 for comb. But why should the next consignment sell at an advance on this? Because this has paved the way—this has created a market. Many buyers came back to me after more Canadian honey when I could not supply them, which, I am proud to say, stood higher in the market than the native produce by its side, and brought a higher price. This is no reflection on the native exhibitors who surrounded me there, nor is it any disparagement of their honey. They had the prejudices of the consumers against them—though unjustly as against themselves, being mostly producers. While I was hampered by the tories, they were hampered by the prejudice against the home product on account of adulteration. My eyes were opened in the most disagreeable manner while in Chicago on the question of adulteration of honey. I knew there was but very little adulteration in this country, and I never dreamed there was so much there. Of course I can only speak of Chicago. It may not be so bad in the east or in other cities. There is a great deal of stuff called honey sold in Chicago, or offered for sale, so much that the people generally are very reluctant to buy extracted honey at all out of the shops. There is a general prejudice against the extracted honey, or the "strained honey" as they call it. And no wonder. Now, I do not for one moment say or suppose that the honey producers are the offenders or are altogether to blame for this. I think the cases where the producers themselves adulterate their extracted honey are very rare. But the people still appear to have pretty general confidence in the comb honey; and if American bee-keepers are wise they will endeavor to preserve that confidence by burying that "sugar-honey" project so promptly and deeply that it will know no resurrection.

You will thus see the great advantage we have and will have in the United States market, for not only extracted honey but comb honey, so long as we keep it pure and unbottled. I could take a hundred tons of Canadian honey to Chicago to-morrow and sell it readily at excellent prices to dealers as well as consumers; but, of course, mostly to consumers. In endeavoring to get the best possible prices for the exhibitors, the honey was disposed of in the best possible manner to advertise it. When I got through I had just got the way open for almost unlimited sales to consumers. When, at first I found the large dealers only offering me 6 to 7 cents for extracted honey, saying they could buy car loads for that, (and probably they could) I made up my mind that I would not sell to these big dealers. I went to the consumers and to the consumers I sold, with the exception of a few grocery stores, out of one of which towards the last, the Canadian honey went so fast that I could hardly keep it supplied. It was near my lodgings, and I used to take a load of honey to replenish the stock nearly every night on leaving Jackson Park. Many hundred of pounds did I carry out myself and deliver to save cartage and expressage, which was high enough there to make any man who was not afraid of work his own carter. The exhibitors get the benefit of this. And I took care that every customer who bought Ontario honey knew he was getting Ontario honey, and he generally came back for more Ontario honey. I tell you

Ontario honey stood high in Chicago when I turned my back on Jackson Park. When people know they are getting a good and pure article, they buy freely and are willing to pay a good price. From what I have seen and heard during a six months' sojourn over there, I am satisfied that the adulteration of extracted honey is quite extensively practised after the honey leaves the hands of the producers; and the suspicion of adulteration among the people is widespread. The address of Prof. Wiley before the International Bee-keepers' Association, which met in Chicago in October last, was not calculated to allay the popular suspicion. This is the Prof. Wiley who is famous or infamous among American apiarists as the promulgator of that *wily* lie euphuniously dubbed by him a "scientific pleasantry" that comb honey was manufactured clean through by machinery without the mediation of the bees at all. A dubious sort of truce has been patched up between the Professor and the bee-keepers on the other side, which, from certain signs at the Convention is not likely to last a great while. Prof. Wiley, who is, I believe, at present, Official Chemist in the Agricultural Department at Washington, gave the Convention some startling figures about the adulteration of extracted honey in the United States as the results of analyses made by him of many samples gathered from various quarters. The bee-keepers, however, do not accept these analyses as reliable, and they are not entirely without grounds for their incredulity. But there is enough and plenty of adulteration which is patent and obvious without the aid of science to unearth it or the dubious assistance of Prof. Wiley's laboratory to reveal it. And while American apiarists cannot be held responsible for the evil effects on the popular mind of Prof. Wiley's original slander on the comb honey (now dying out) they may be justly held responsible for whatever evil may accrue to them on account of their "sugar honey" speculation or project, as it was apparently born and bred among themselves.

Our apiarian exhibit at the World's Fair cannot fail to enhance the standing and promote the future interests of apiculture in Ontario. Some five to six hundred weight of the choicest of the Chicago exhibit, both extracted and comb, was disposed of to the Dominion Government for the Antwerp Exposition, which opens in Belgium next May. As to our future markets for Canadian honey, I have but little faith in the availability of those that are trans-Atlantic or trans-Pacific. And, while we ought to improve every opportunity of seeking and entering those when we come to need them, I would strongly urge the cultivation and development of the home market and those nearest home. The consumption of honey in Canada appears to be increasing in about the same ratio as the increase of production, there being but little exported and very little to export. Let the production go on increasing as it may. It is safe to say that the consumption might be doubled and quadrupled and there still be abundant room in the home market. Manitoba and the North-west will consume large quantities; and I have my doubts about the capabilities of honey production within her own territory. The adjacent states outnest supply her as they cannot now supply themselves. Honey is as yet but little more than a luxury on Canadian tables. With nothing but the pure article on our markets, at reasonable prices, it must become more or less a staple article of food. When there is a surplus for export the restrictions on our nearest foreign market will probably have been modified or altogether removed; and if I correctly interpret the trend of things apicultural over there, the United States will not be able to supply their own people with honey unless indeed they should have recourse to the wholesale development of the "sugar honey" theory, and if they did, the product would not be honey and the people would not have it. It seems to be a fact that some of the best honey producing States over the way are losing ground in their nectar-yielding capabilities and losing materially. At Chicago I was surprised to hear from the representatives of those States, of failure here and failure there, and failure one year after another. Whatever the cause or causes—which I shall not here enter into—the fact is there, and my opinion is that there will be ample room in the mouths of this continent for all the honey this continent will (I shall not say can) provide. The question with us is has Ontario seen its best days in its honey producing capabilities? However this may be, one theory is certain, the Ontario linden honey stands at the very head, and the linden tree is rapidly disappearing down the open and capacious maws of the pulp machines, the saw mills and the tallow fires. It is disappearing much faster than the uprising sprouts and saplings (spontaneous and cultivated) are taking

its place. The basswood tree ought to be planted and cultivated by every bee-keeper in Ontario, especially every farmer bee-keeper. If his circumstances require him to remove the basswood from his woodland, let him plant it around his domicile, along his fences and by the roadsides. Within a few years I have planted nearly a thousand, and shall not have to live long to see some of them yielding nectar for the honey-bee.

Mr. Pettit: I arise to express my pleasure at hearing that excellent paper. It just reiterates what I told the Convention at Walkerton last year, that our best market was across the line, and that our best plan was to keep our hands clean, and our reputation unsullied. There is a prejudice, and a just prejudice, in favor of Canadian products, and one reason is that they have confidence in the purity of our produce. Make comparisons. While our cheese sold at 11 cents, United States cheese sold at 9½. A United States citizen commenting upon these things said, "One of the strong reasons why is that we make a spurious article that legislation upholds, and the people do not know, but they are being fooled. Since we do not know that we are getting a good article, we don't want to pay much for it."

Mr. McKnight: I was in hopes that the last speaker would have added to his remarks a vote of thanks to the gentleman for the very able report he has made as a representative of the bee-keeping industry at the World's Fair. I am sure every one of you feel not only like giving him a vote of thanks, but you would like to see that vote embodied in a suitable form. I am quite incapable of expressing my feelings as to the way he has discharged his duties there. Everybody knows that when Mr. Pringle sits down to commit his thoughts to paper there are few who can do so more forcibly than he. I have much pleasure in moving that the best thanks of this Association be and are hereby tendered to Mr. Pringle not only for the very able report, but for the way in which he represented us at the World's Fair last year.

Mr. Hall: I rise to emphasize the remarks made by Mr. McKnight in reference to our representative at Jackson Park. I endorse his view of writing out a proper vote of thanks to the man who looked after not only our interests but the interest of our country. —Carried.

Mr. Pringle: I am sure I do not deserve the very kind and flattering expressions of opinion and feeling of which I am now the recipient. I simply tried to do my duty, and if I have succeeded in satisfying the bee-keepers in this, that is all the payment that I wish. I am sure I thank you for your very flattering reception of my services.

Mr. Holtermann: There is a very important point touched upon by Mr. Pringle. I refer to the reduction in duty on honey, which is proposed. I would have mentioned this in *The Canadian Bee Journal* before but I thought it was in the interest of Canadian bee-keepers to say nothing about it until it has passed, over on the other side. Should the *Bee Journal* publish it at present, or is it in the interest of bee-keepers here to not to mention it yet?

Mr. Pringle: I have incorporated it in my report. If the meeting thinks it inadvisable to put that before the world, the committee can revise that.

Mr. Holtermann: We would like to publish the report of Mr. Pringle, but would it be wise for us to now in the *Bee Journal* to say anything about it?

DISCUSSION *RE* COMMITTEE ON LEGISLATION.

On Mr. Holtermann's motion to re-appoint the Committee on Legislation the following discussion took place:

Mr. McKnight: I am opposed to the motion, and I want briefly to give my reasons. I believe that the proposed bill is not in the interest of bee-keepers, for the reason that its provisions cannot be carried into effect, therefore I conclude that continued effort to secure what can be of no use to us is superfluous and the funds will be thrown to the winds. Since I was last on the floor, my thoughts have been turned somewhat in a different channel. I believe in the right of the majority to rule.

I have also expressed the belief that the majority of those present are in favor of the bill, therefore, drawing the inference that McKnight, believing in the rule of the majority and believing that they believe their ideas are in the best interests of bee-keepers, why does he continue to set up his opinion? While I believe in the right of the majority to rule, I do not believe the majority is always right, and I believe in the right of the minority to use their influence to convert those who believe in it to their view. I will always believe in my right to an opinion while believing it to be well founded. That is what I am doing now. I say that the bill, if it becomes law, will be inoperative. It cannot be put into force, and the law enacted that cannot be carried into execution might just as well never be carried. Why do we say the bill cannot be enforced? Because of its provisions. The bill asks for legislation to prevent the importation of "sugar honey." It is just here that I see where the law will be inoperative. How could the importation be prevented if it could not be discovered? It is not long since experts could not discover when the honey was adulterated: it can now be discovered without a doubt, but can every hundred weight of honey that might come across the border be subjected to that analysis? That Bill, if it were law to-morrow, could not be enforced. It will be inoperative. The other conditions are superfluous. We have already all the protection asked for, and therefore to get that protection is no use. I use my influence to prevent money being spent uselessly. Save our funds and use them in ways that would be sure of a return. I have said that bee-keepers have all the protection that the law can afford them. If sugar honey is sold under the name of honey the seller is liable to the penalty of the law. If the law of this country does not afford you all the protection you ask for, I would like you to point me out the fact.

Mr. DARLING: I just want to make a remark or two in reference to the clause of the statute which Mr. McKnight has just read. He claims that that is all the protection we need. I claim it is not. There is not a man who has tried it as an experiment and advocated the putting of it on the market but what has said that it is sugar honey. Now take extracted vanilla. If you take the price list of that, you will find that it varies from $12 to $18 a gallon. What makes the difference in the price? Simply this, the best vanilla, sold at $18 a gallon, is the pure vanilla. You can get, for less money, a small proportion of the vanilla bean mixed with a large proportion of some other bean. Where is the protection? They are all sold as vanilla. Why do they not prosecute those parties? I know we have men who smuggle other things besides sugar honey. The man who would smuggle sugar honey would be liable to the penalty as for any other smuggled goods.

Mr. HOLTERMANN: There is perhaps no one who has advocated having legislation of this kind more than I have myself. In regard to detecting the adulteration of imported honey, if we have a country in which this is not allowed to be produced, there is no danger of importing from other countries. If this Food Bill covers this, why does that Act not cover the oleomargarine?

Mr. MCKNIGHT: That Act has been quoted several times. If the Act you propose went as far as that goes; if you excluded the importation of honey, adulterated or unadulterated, it would be all right; but you don't. Oleomargarine is not butter, and it is not called by that name.

Mr. HOLTERMANN: I do not think it is necessary to discuss it much further.

Mr. CORNELL: The demand for this legislation arose at a small local association meeting in the County of Oxford. They sent a deputation to the annual convention of the Ontario Bee-keepers' Association last year to promote the procuring of legislation on this matter. That local association seems to have gone off at half cock. The subject had been discussed in one or two of the bee papers some months before. It has not been found to this day that the circumstances we are trying to legislate against have happened. We are not threatened with the ruining of our markets by the production of sugar honey. Does any man know of the production of it since we met last year? It is time enough to cross the bridge when you come to it.

Mr. HOLTERMANN: I do.

Mr. CORNEIL: When the matter was brought to notice first in the bee papers it was assumed that there was more profit in it than in the production of honey where the raw material costs nothing. You pay six cents a pound for the sugar you feed your bees with. Six pounds of honey is the only return you get from ten pounds of sugar. Is it reasonable to suppose that such a business would be carried on? I think it will never come. Mr. Hutchinson is the best apicultural journalist in America. He has made the *Review* the best monthly bee paper published in the English language, but he has made some of the hugest mistakes in regard to bee culture. He is mistaken in regard to this sugar-honey, too. If this is likely to be produced and placed on our market, I want protection as badly as any of the rest of you. I will suffer if others do, but I have not the slightest fear of that, because it won't be produced. I contend then that it is unwise to ask legislation against what does not threaten us.

Mr. PETTIT: With regard to Mr. Corneil's statement that he gave Mr. Hutchinson the credit of being a very sharp man, so do I. Mr. Hutchinson experimented and gave the result in his journal. $7.50 worth of sugar fed to the bees and converted into sugar-honey, sold for $20. More than that, it was said that people did not attempt to push it off for what it is not. Yes, they do. Mr. Hutchinson did. He took it to the Exposition and put it on exhibition. They had a poor year. He took it there and he put it against his brother bee-keepers, and it took the prize. He pocketed the money. He sold it to his neighbors but did not tell them until afterwards. When the paper that has been circulated in Canada proves that these things can be done, and have been done, it is a dangerous thing to let it go any further. We should keep our hands clean; if we have a law that means a penalty of $200 or $300, or three months in jail, it will be a rod held over adulterators, and I say it is wise to get legislation. If a sample of this stuff should reach the British markets, it would close the market until the youngest man here was grey headed. An Englishman won't forget it. The American people allow their honey to reach the British markets through dirty channels, and I tell you the United States will suffer for that, and are suffering from it. The honey from the United States just stinks in the nostrils of the people of Great Britain because it reaches them in an adulterated condition. We want to do all we can to prevent ours from getting in that condition. The best test we can give is to ask for legislation ourselves. It would look bad for someone else to ask for legislation as they are doing on the other side. Let us do so ourselves so as to convince the people that we want to give them a pure article. To get and hold a market you must have the article. That is the first requisite. The article is within our reach. The next thing is to give the people what you represent it to be—pure. This is a crisis in the history of the bee-keepers of Canada.

Mr. MCEVOY: I agree with Mr. Pringle although I am with Mr. Pettit to put down the sugar-honey fraud. I do think we need legislation on it. As far as the paying business is concerned—it will pay. If that stuff is manufactured and put on the market it will soon kill us. It will break down the market for comb honey. I have a letter from a man stating that there had been $700 worth of sugar-honey sold in one place, and the firm who had manufactured the stuff was going to make 50 tons next year.

Mr. PRINGLE: If that is really the case, that $700 worth of spurious honey has been sold in the city of Hamilton last fall, and that is known to any citizen of Ontario, instead of writing here or there about it, I hold that his duty is go on and prosecute that man under the law, and I would ask why that has not been done.

Mr. MCEVOY: I only had this letter. The agitation started by Hutchinson and seconded by Professor Cook has raised a hubbub.

Mr. HOLTERMANN: A question has been asked as to where this is practised. I think we have a right to fight a man fairly and squarely every time, and I think that if there is a man present if he knows of it, he should get up and say where it is. The honey was produced in Tilbury Centre. It is common report in that neighborhood. The man's neighbors have told me of it. It was carried on successfully and on a large scale. A portion of that was put on the Detroit market as a white honey before the clover season was on. The dealers said it was the finest honey they ever saw. They intend producing it next year if they get a chance. The reason I have not taken any action is that we

feel we can get the legislation. You see the importance of such legislation? Our bee-keeping industry is jeopardized, and I do not see how any one can vote against it.

A MEMBER: After gathering the evidence we have heard to-day, I think it would be foolish to end it here. We are very near getting in at the next session. I don't think it would be wise to drop it now. If you think that less than three delegates would do, I would be favorable to that; but if not, send the same three again as they understand it now better than others would. I know the second time I go I am worth far more than I was at first.

Mr. BROWN: It would be an injustice to me as one who volunteered my services and went at my own expense in this cause to drop it, and it would be an injustice to me not to speak. In the face of the very able paper read by our worthy representative, I think it is very necessary that such an Act as we are asking should be passed. Personally, I know nothing about it. I have never seen it done, but I have no doubt it has been done and can be done, but I have no proofs to give. The remark that Mr. Cornell made just now, that it was time enough to cross the bridge when you came to it was all right, but on the other hand, you all know that it is too late to hit the dog after he has bitten you. Of course our friend Mr. McKnight is an able speaker, but I am surprised at the stand he has taken in the face of the paper Mr. Pringle has read. At the same time I heartily agree with him that every man has a right to use his own discretion. If he is opposed to this, why not tight tooth and nail against it just as we who believe in it will fight for it? We should endeavor to produce a pure article. Our honey is pure, as shown by our representative to Chicago, and the people there prefer our honey to their own, and for that reason I would strongly uphold legislation for a pure article.

Mr. PRINGLE: In view of what my friend here said, it is necessary for me to say something. I have taken no side yet. I have neither opposed it or sided with it. There are some questions that are so nearly balanced to the man who considers all sides of the question that it is really difficult for a man not governed by feeling or prejudice or reason, to decide. I have watched the course of things, but have taken no side, only to condemn the adulterated honey. Is it wise for this Association to ask legislation? We are all agreed that adulteration is an abomination, and that we ought to take all possible steps to put it down. To confess the truth, I am still undecided how to vote in this case, because I am endeavoring to act reasonably and justly and in the interests of this Association in whatever I may do. Is the asking of legislation necessary at the present time? I am not altogether convinced of it. After hearing of the manufacture of sugar honey in Canada and its being put on the market at the present time, I am not yet convinced. What ought to be done is this: Those parties who have done this ought to be proceeded against at once and punished. If they are proceeded against and it is found that the law is not sufficient to stop it and stamp it out, I am with you heart and soul to go for a law that will stamp it out. The arguments used by Mr. Cornell and Mr. McKnight in regard to our ability to go on with this thing now, of course have a certain weight with me. We are a public body. We are using public money. We ought to put that money to the best use. I am not charging you with attempting to squander the public money. You are all sincere in your opinions that these steps are necessary now. Had I been at the annual meeting last year, and been called upon to take a position I certainly should have said, "not yet." You differ from me in opinion. I do not think the majority is always right, in that I am generally in the minority. I am in doubt now which side I ought to take. I think I shall just let the matter take its course. I wish to stamp this out, as well as you do, and I want it done promptly and effectually. If we have not yet a law that will do that now we must have one. Whether your law will prevent the importation of sugar honey I have my doubts. I have my doubts that when you get your law it will be successful in preventing the importation. The thing has really not been proved in the United States to my opinion. I have been over there for several months and I do not think the article is produced there yet.

Mr. HOLTERMANN: In respect to that question as to whether it has been produced in the United States or not, Professor Cook says it is being made in large quantities. Mr. Root says he does not believe Professor Cook's statement.

Mr. Couse: One thing I would like to see is the stopping of the production of it. I do not know that our law would say that we could not sell it on the other side of the line. Have we the power to produce it here and sell it on the other side of the line?

Mr. Pringle: As I understand it, a man can be prosecuted for manufacturing it. It could be produced and sold as Canadian honey, and the consequence would be that we would be knocked right out.

Mr. Brown: In your paper you say, Mr. Pringle, that the American consumer prefers our honey. I would like to ask why the people prefer our honey to the American honey?

Mr. Pringle: I said that the prejudice in the minds of the American consumers was against the extracted honey, but they still had pretty good faith in comb honey. I, at the same time, said that I hoped the American bee-keepers' would still preserve that confidence in their comb honey and would bury the sugar honey question.

Mr. Pettit: I don't think we ought to stick at a few cents in obtaining a law that promises such good results. If it would be creditable to the Association I would go without any money.

Mr. Pringle: Is there not a danger of approaching the Government for legislation without necessity? Did they not say to you, "Have you not a law to punish the offenders?"

Mr. Pettit: No; they never said anything of the kind. They wanted us to tack on a bill that those who produced it should label it. That would only make it legal and respectable; and then as to the penalties, I said we wanted to form a law that meant something.

Mr. Pringle: Is there anyone in the audience who can tell what the penalties are for selling adulterated honey?

Mr. Hall: Mr. McKnight says we have a law to prevent adulteration. Let me inform you that England is against adulteration. I sold coffee for fourteen years in that country. You could buy that coffee pure, and you could get it mixed with chicory, but it must be labelled in that way. We spoke of the oleomargarine. That is prohibited from manufacture, importation or sale, but you can sell it. You can sell it by mixing it with butter, and you will have to be a pretty sharp man to detect it. I glory in a minority. We started in a minority in foul brood. We started in an insignificant town the spraying of plum fruit trees, and we got a law that is effectual. The Government thus far has given us every encouragement in this. They don't pooh-pooh the idea. Mr. Pringle in his paper spoke about the views the United States citizens had of our honey. I was delighted to hear it. They have confidence in us, and should we permit, through our negligence, a loss of that faith?

Mr. McKnight: Can you tell me in what way the legislation that was sought last year will better our condition as bee-keepers, than the law allows at present? Until that law is proved to be ineffectual we do not require another. Laws are supposed to be just, and penalties are fixed in proportion to the crime. There is where I think you will fail in getting that particular portion of your Act passed.

Mr. Hall: The Act we want. The penalty comes afterwards. The stealing of a cent is theft in the eyes of the law as well as the stealing of $50,000.

Mr. McKnight: The laws were made for the people.

Mr. Hall: That is it. They don't want to protect themselves; they want to protect the people. This is a specific law against the manufacture. I can produce to you a pound of sugar comb honey for every pound of sugar you give me. We want to guard against the monoply.

Mr. Darling: Mr. McKnight asked a short time since where we expected to get any advantages from this proposed bill that we do not already possess. I answer that by asking another. If that bill he has spoken of gave us all we wanted, why did they have to pass another bill to prevent the manufacture of butterine? If that Act will not

cover buttering, it will not cover this if sold as sugar honey. Supposing it was labelled "sugar comb." Does the proposed law cover this?

Mr. HOLTERMANN'S motion was put and carried.

The election of officers was then proceeded with, the result of which is given on page vi.

QUESTION BOX.

Q. "How is honey ripened? Is it simply placed in the cells and evaporated by the current of air revolving in the hive, or is there any likelihood of the honey being gathered by the field bees and afterwards rehandled by the bees in the interior of the hive."

Mr. MCKNIGHT: My idea of the process of ripening honey is the expelling from it the superabundant watery part of it. If that be what ripening honey means, it is very easily understood how it is done; that it may be done either in the hive or outside the hive everything being in proper condition, but I would like to refer to Mr. Corneil for an explanation of that process. I have my own ideas and, leaving the process of ripening out of the question, my idea is that honey can be just as well ripened outside the hive as inside, and that it can be done from the outside without any evil effects. I have a clear and distinct idea in my own mind of what ripening honey means. My idea is that any system adopted by which that superabundant quantity of water is drawn off is a process of ripening. We understand a standard and what good honey is—its weight, density and specific gravity, and we judge of it by that standard. Everybody knows that nectar is found in the hive in diluted state. It is not up to the standard, and therefore some means must be employed by which that moisture is driven off. If honey is rapidly gathered it will be rapidly sealed and the result is that it will not be ripe when sealed. I believe that the process of ripening will go on according to the temperature of the hive, but will go on much more tardily through having to be expelled through the capping of the comb, than by the process which Mr. Corneil follows. I was amongst the first who got up something special for the ripening of the honey. It must be ten or twelve years ago, that I got an article made. My machine is a double tin can, with the bottom of the inner can about a couple of inches above the bottom of the lower can. The bottom of the lower can is an ordinary tea kettle bottom so that I might set it on the stove hole. There is a faucet right through the two cans. I pour water into the space between the inner and outer cans, so that the honey, being in the inner can is heated by the water boiling in the other one. That is my process. That is what I understand by ripening honey.

Mr. R. H. SMITH: You mean artificial ripening, I suppose?

Mr. ALPAUGH: My opinion of it is that the honey is ripened in the hive. The bees can ripen the honey more in 24 hours than you can ripen it in one week. By going to a great expense may be you can ripen it in less time than the bees, but in trying to ripen honey in large quantities, before you can evaporate it, there will be fermentation started. It may be so little that it is scarcely untenable, but it is started. Take this honey just as it is gathered, and see if you can ripen it. If you take it when it is nearly ready to cap, that is only finishing it outside the hive.

Mr. CORNEIL: I can take a quantity of honey—say ten pounds—and mix it with ten pounds of water and put it inside an evaporator, and inside of four hours I can make it thicker than any honey Mr. Alpaugh ever saw.

Mr. ALPAUGH: And not fit to use.

Mr. WELLS: The bees keep fanning, and thus evaporating. Weigh the honey at night, and you will find in the morning it weighs much less. They keep fanning all night.

Mr. HALL: My observation is this. You feed the bees with a very thin syrup. When they go home they scatter it inside the hive. I have noticed in gathering honey

that the outside combs were shining with honey. Going there in the morning, there was not a particle to be seen. My theory is that they move it from place to place and the action from the stomach of the bees evaporates it. I believe the first stage of evaporation is done by the stomach of the bees. I also noticed in feeding bees where I could see them, they would get in a cluster and hang there. I suppose they were staying there to hold it in their sac to evaporate the moisture. I have noticed the bees going in full and feeding the downy bees, and the downy bees spewed it into the cells. This transfer would evaporate it.

Mr. McEvoy: The heat of the hive has a good deal to do with it. You can get the honey evaporated but you can't get the flavor that the bees give it, by outside evaporation.

Mr. Pettit. Mr. Hall used the term "evaporate from the stomach." My theory is that bees gather the nectar and put in it what we call the honey sac. I believe that sac has the power of evaporating the water to a certain extent, when the bees are not so rushed. That is not evaporation. I have noticed this throwing off of water, but it is not that they have been taking water. It is part of the honey. They throw off this watery substance. The young bees get it after they take it to the hive and they retain it for a shorter or longer period, according to the necessity of the case. If they are crowded a good deal they do not retain it so long, and as a result it goes to the cells thinner. The bees have in their system the power of separating the water from the nectar.

Mr. McKnight: Do you believe that is the whole process?

Mr. Pettit: No; that is part of the process.

EVENING SESSION.

OUR PERSONAL RESPONSIBILITIES.

Mr. J. K. Darling, of Almonte, delivered the following address:

There are times when, as we jog along through life, we meet some things that make us glad and some things that make us sad. I am glad that I have come to this town for several reasons. I have taken a pleasure in knocking about from one place to another, but I must say that I have been as favorably impressed here as I have been for some time. I was present here yesterday when the Mayor gave us his address of welcome. He spoke of the natural beauty of the place; of its financial prosperity and of some other things that he thought were worthy of our notice. There were some things, however, that he did not speak about, that I thought I would mention, in a word or two; that is the artificial beauty of the place. I was very much pleased when day-light came around, the day after I got here, and I saw the width and symmetry of the street and the buildings that are ranged on both sides. I do not know that I have ever been in any place that I was so much struck with the beauty of as this place. I do not know that I believe in cities being laid out as if they were on paper. They remind me of an architect who drew up a plan for the Governor's palace. He thought he had just the place. He put it in the centre of the town, with streets radiating in every direction, and the house was built and occupied. I don't know if it is true, but the story goes that when washing day came around, there was no back yard in which to hang out the clothes. I have not seen anything here that would mar the natural beauty of the place. I have been from home, and I have generally carried back with me the thought that home was the best place of all. I expect to go home with the same feeling again, but I have not been anywhere where I have had a better impression of what I have seen and heard than in the town of Lindsay. Perhaps you know why we have come here. Perhaps if I would ask you the question, "Why we are here?" you would say, "To learn." However, I will say

that whether we have come with that purpose or not, we have all come here as educators; whether we will it or not, we stand before the world as educators. Man is an imitative animal. He is more. He is an animal with intelligence. He in turn becomes a teacher to those he comes in contact with. Whether we will or not, we all exercise an influence on others. When I say that I mean myself and yourself. We are here as educators and we are going out of here as educators. We are here to receive and we are going out to give out. As I said a little while ago, man is an imitative animal. The ideas that he receives from others, he again transmits. According to that we are mediums. We are responsible to those around us for the diffusion or reflection of this influence. If we receive any ideas from another and transmit them again they are becoming, more or less, our ideas, and they in turn become ours to other persons. What we feel and what we know glide out imperceptibly. It is impossible to have our hearts and minds filled with one thing, and hold conversation on another and different thing altogether, for any length of time. Truth will out. Then if we refrain from speaking. Perhaps our contact with some of our neighbors, those that we meet with, will reveal something that we are astonished at ourselves. Our actions are the index of our thoughts. We often hear it said by persons who have the training of youth, that their tempers must be subdued; their wills must be broken. Well, now, I would give very little more for a boy who had the temper taken out of him than I would for a jack-knife in the same condition. We must use our position as educators to see that these wills are guided in a right direction instead of leading them down to something that will be a disgrace to them; those fiery tempers, this push, will lead them on to something better and will lead them on to do something we have tried to do and in many cases failed in. We have got to do at once what we are going to do, or perhaps the opportunity is lost forever. These boys in turn become educators whether they will or not. The boy that is on the street is watched by those who are around. The girl that is going to school is watched by her companions. These are educators in a certain sense, as the young will follow their example. I do not know whether any of you have heard the story of a lady who could tell what kind of a girl she had in her house by hearing how she spoke to the cat. The girl that would find the cat some place where she ought not to be, and would say "scat" was just about all that she ought to be. You know it is often said in a sort of slang way that we are going through this world for the last time. It is a solemn fact. We are going through this world for the last time, and as soon as we pass away others fill our place. This, that is so often said in haste and in a thoughtless manner, is such a solemn truth, that it ought to make us use the moments as they fly. Let us make our impress on others. In some of our industrial establishments they have a sort of an electric clock that is a regulator or tale bearer on the night watch. On the face of the clock is a little pin that is connected with an electric wire. If the watchman is where he ought to be, at the end of every fifteen minutes he can put a key in the hole in the face of the clock, but if he lets that fifteen minutes go by, he could not drive the key in with a sledge hammer. That is the way with us in life. We are not bound down to minutes, but we must be prompt. If we could accomplish what we set out to do, we must not let duties pass. Let us be careful that opportunities are not lost and lost forever. I have thought that perhaps the little lessons that we have to deal with are not such bad educators in that line. Now, as bee-keepers we know that in many things we have to be prompt; if not, we might as well not do anything at all. I do not know that I should occupy very much of the time here. I feel that what is said here to-night will probably be remembered by some, not so by others; but I just wish to go on record as one who is trying to leave behind me an impress for good. I hope that every one of us will feel it our duty not to live for ourselves only but for those who are around us. I feel that we ought to do the best we can for others. We are not living for ourselves. I have been pleased with the reception that we have received here, but I forgot in the first part of my short address to say how pleased I was with the music we have listened to here to-night. I am also pleased that we have a larger proportion of ladies at our meetings than we have had before and hope that our annual meeting will improve in that respect until the ladies will just feel the same interest in these meetings.

BEE-KEEPING AS A CALLING.

Mr. PETTIT followed and said: My speech will not be a flowery one like the address you have just heard from Mr. Darling. I am going to talk just a little about bee-keepers. I want to begin by saying that I do not believe, as bee-keepers, we prize our calling as we ought to. I do not believe we appreciate our calling as we ought to and as it deserves. I I don't believe we get in love with it and make a perfect success of it as a rule. To make a success of anything in life, you want to think of it; turn it over in your mind; enthuse yourself with it; get in love with it; then you will do the next best thing—talk about it. Impart that spirit to other people. Our calling as bee-keepers is worth our best attention as worldly things go. I think we have tested our honey by the side of the honey of the world. It has had that severe test, and it cannot be disputed that we have the very best honey in the world. We not only have the honey, but we have the country to produce it. The way to make a market and keep it is to make the honey what it ought to be and have a large surplus on hand. I believe there ought to be a local association started in every county in Ontario, and I believe that each one of these ought to be affiliated. I believe that each one of these associations out to send delegates to the parent society, then we would have a representative association. Such an association as that has power with the people; then the people will respect us as they do not now. (I don't know that they disrespect us.) What about the funds? If we persevere in this matter and make it what we ought to do and will do, it will be of so much importance to the country that we can approach and ask the country for more money. It would be to the advantage of the country to give us more if we prove ourselves worthy of the position we occupy. I am just going to give you a few figures so that I can show you what other associations get. I do not advocate asking for more money until we do more. The Central Farmers' Institute gets $1,600, the Fruit Growers' Association $1,800, the Eastern Dairymen's Association $2,000, the Creameries Association $1,499 and the Western Dairymen's Association $2,750. Remember all these are Ontario organizations and the last three named, the Dairymen and the Creamery Associations, really represent the same class of people—people who keep cows. They get $6,249. I believe that is money well spent. I believe the Government is justified in giving it, and we, if you take my advice and go to work, would place curselves in the proud position to feel that we are doing more, and the Government would not be censured for giving us more; but we must do something before we ask for it. I want to throw out a caution. You remember the statement made here to day that sugar-honey is being produced in this country and sold. If it is a fact, it is a terrible state of things. I want to caution everyone here—don't tell anyone, but we will soon be in the same position as the Americans when they sold bass-wood hams and wooden nutmegs. We do not want to show a selfish spirit, and we do not want to show that we like curselves better than we like any person else. There are people we meet who put me in mind of a little boy who showed rather a haughty, proud disposition. His mother said to him, "Don't you like your mother?" "No," he said. "Don't you like your dear mother who does so much for you?" "No." "Don't you like your papa who buys you candies and toys?" "No." "Don't you like your brothers and sisters?" "No." "Don't you like anybody in this world?" "I just like myself."

Mr. DARLING: In regard to what we might get the Government to do for us. We cannot approach the Government and show them what we are doing. We must first show them the amount of honey that is produced. Let us think of it and take some action on it. If we can't do it let us get the Government to do it.

Mr. HOLTERMANN: When the census was taken, the Government reported about 170,000 colonies kept in Ontario.

Mr. PETTIT: Four-fifths of the bees kept in Canada are kept in Ontario.

QUESTION BOX.

Q. What effect has upward ventilation on bees in summer or winter?

Mr. R. H. Smith: The effect in the summer, of course, is to reduce the temperature in the hive, and, if it is very hot weather, to give the bees a better chance to work. I may say that last summer while visiting in St. Thomas, I had my ideas considerably changed on the matter of ventilation. I was always under the impression that it went up. In visiting one place I was shown the apiary, and I there saw that the ventilation was downward instead of upward through the hive. In regard to ventilation in winter it is only necessary to have ventilation then to carry off the surplus moisture. If the moisture has no escape it usually condenses and gets mouldy.

Mr. Couse: I don't know that I can say very much about it. My ideas are something similar to Mr. Smith's in regard to upward ventilation. I found last winter where the hives were closely covered on top and the cellar being cold, there would be ice in the hives. There was no fire where the bees were. The moisture was frozen on the bottom. Those that had upward ventilation were not so. There ought to be upward ventilation, particularly where it is cold.

Mr. Aches: I ventilate by giving them plenty of ventilation below. Place them about half an inch from the bottom board so as not to let the heat escape. I would not allow upward ventilation in my hives. If there is any moisture it goes up. There is no moisture in my hives in the winter. I want heat in my hives. The honey will ripen more quickly by having heat.

Mr. Myers: Where will upward ventilation stop? Mr. Smith hinted that there would be upward ventilation if we had a light covering on to let the moisture pass. How light has the quilt to be before there is upward ventilation? Could we not get at something, as a society, that would define upward ventilation from what is not considered upward ventilation?

Mr. Aches: Put a cushion on. The heat is kept in. I don't leave the top on.

Mr. Smith: In reply to Mr. Myers, I do not think that any thickness of covering would stop ventilation if it were upward.

Mr. Hall: I would like to know what you mean by "upward ventilation." I don't want the upward ventilation if you can give them bottom ventilation.

Mr. Alexander: As regard upward ventilation in winter, it depends quite a bit whether it is out doors or in. If you take it in the cellar where it is moderately warm, it doesn't matter whether you have upward ventilation or not. I have had them with the quilts off or on—it doesn't make any difference. In winter outdoors you must make a little ventilation somewhere, or otherwise you will have sensibly smoke. To ventilate my bees outdoors I raised the quilt just a little to allow the moisture to escape. For summer I sometimes give upward ventilation or downward ventilation at the top. Any way I make an opening in the top of the hive. The air rushes in so long as the bees fan. For comb honey I don't open up at all. The clear air rushing in there prevents them going up.

Mr. Sherrington: I don't want ventilation in the summer at all. I find the more I keep the hives covered, the better the bees work. As to winter ventilation, they winter out doors and I raise my hives and put a rim under. I leave an entrance open.

Mr. McEvoy: You ought to put a cloth across the frames and never put the lid down on the hive tight. If you can watch them and keep the shop clear from them, it is better to do so. If it is a strong colony and the lid is tight, it will steam up. It is not safe to leave the lid down tight. There is no ventilation with that.

Mr. Stokes: My plan is to have a hole in the centre of the hive at the ends of the frames and leave it open all winter. Cover the hole with shavings on top. Leave the fly hole open. For three winters I have kept them that way and always successfully. I use a little cushion on the top, in the cellar.

Mr. HOLTERMANN: I am specially interested in this question as I have made a change in my method of wintering. I would like to get further information. In winter heretofore I have used a cushion. Might I ask for an expression, a show of hands to let us see how many use the propolised cloth?

Mr. PETTIT: I would advise you to raise the hive and put a cushion on it. I have stands for the hives to stand on. Nail strips of board along the top so that you will have a stand eighteen inches high to put the hives on. One board is about three inches higher than the other. There is an entrance in the front, three inches high. The hive is about nine inches deep—a little more. Raise it in front, so that you have both a front and back entrance.

Mr. PICKET: How many leave the propolised cloth on?

The vote was in favor of leaving it on.

THURSDAY MORNING SESSION.

REPORT OF THE FOUL BROOD INSPECTOR.

During the season of 1893 I visited bee yards in the counties of Lambton, Middlesex, Elgin, Ontario, Oxford, Brant, Wentworth, Halton, Peel, Wellington, Perth and Huron. I examined eighty-nine apiaries and found foul brood in thirty-four bee yards. In three apiaries the disease had not made much headway; while in four it had. The remaining twenty-seven foul broody apiaries were in a horrible state with foul brood; and the death rate in several of these diseased apiaries was the largest I ever saw. Before I examined these thirty-four foul broody apiaries, over five hundred and fifty colonies had died of foul brood. It would have taken a good deal of time to examine every colony in every diseased apiary, and would have delayed me very much at a time when I was wanted as soon as possible in other places, so, for this reason, I cannot tell how many diseased colonies there were in the thirty four foul broody apiaries when I visited them the first time. I took the greatest of pains to explain everything to the owners of these diseased apiaries; how to cure their foul broody colonies by the methods of curing foul brood, which is by far the best of any in the world. And, as it cannot and never does fail when properly done, it should be followed by the bee-keepers of every land. Bee keepers in two counties, while overhauling their colonies very late in the fall, came across a kind of dead brood that they dreaded might be foul brood. I got orders to go and examine those apiaries, which I did. I found it to be genuine foul brood. As these apiaries were large and a good distance from other bee yards, and in the hands of good men who were very anxious to get their apiaries cured in the most profitable way, I told the owners to fix them up the best way they could and cure early in the next honey season. I have had a few apiaries that came in late left over each year. Judging from those I examined the second time, and from those I heard from, I am well pleased with the grand cures the owners made; and I believe that those apiaries that came in too late in the fall to cure profitably will be cured in June. I was very sorry to have to burn fifteen colonies with foul brood in the county of Middlesex. I always do everything I can in every possible way to get the bee-keepers to cure their foul broody apiaries I have written many long letters hours after I should have been in my bed, to the owners of foul broody apiaries, explaining to them how to cure foul brood, and I have spent several dollars out of my own pocket in helping to get the cures made. But when I do all I can and the owner won't cure, then I have to burn up the diseased colonies for the public good. I have been four seasons inspecting the apiaries of Ontario and found foul broody apiaries by the wholesale every year. I had to get the curing done by all classes of men. Many of these men had to be looked after very closely to keep them from making big mistakes. I got the curing done in grand order and in the most peaceful manner. I am very much pleased to say that no man could ever wish to deal with a better lot of men than I met with on my rounds through Ontario. My time, car fare and livery hire amounted to $504.55.

WM. MCEVOY.

Mr. Myers: You say you found a great many apiaries in which foul brood existed. Do you think foul brood is being cured as a whole, in the Province of Ontario, or is it spreading?

Mr. McEvoy: It is decreasing.

Mr. Aches: I am a delegate from Middlesex. What instructions did you give these individuals, especially beginners, as to how they should treat their bees in order to prevent the spread of the disease in the vicinity?

Mr. McEvoy: That is in reference to late in the fall?

Mr. Aches: When honey it not coming in.

Mr. McEvoy: When I was in Strathroy, in the county of Middlesex, I explained to the owners of diseased yards thoroughly how they were to work at these in the evenings. If they examined them on a morning of a fine day when there was honey coming in, robbery would take place. I told them to do the work in the evening. Take the bees out and shake them down and give them a foundation. If there is no honey coming in, feed them sugar syrup. Take them in lots and shake them. It means reduction of bees. If other bees get track of it in daylight, they will rob the honey and spread the disease. Do it at night.

Mr. Aches: My reason for asking was that I was in the town of Strathroy and almost every one I met asked me what instructions the inspector gave. They were treating the bees in the middle of the day. I thought likely some of them were spreading the disease.

Mr. Pettit: It seems to me that the law should provide for a man treating the bees in the way the orders were given, and not allowed to open the hives during the day.

Mr. Holtermann: I was at the Strathroy meeting, and I may say in support of Mr. McEvoy that there was a general feeling that the foul brood inspector had done his work thoroughly and well. I move that the report of the foul brood inspector be received and filed. Mr. Gemmell seconded the motion.

Mr. Cornell: There is a real pleasure in being able to say an agreeable thing sometimes. I congratulate the inspector on the improved report that has been presented this year. He has given us far more particulars than he gave us in former years. I shall support the motion with pleasure. The motion was carried.

Mr. Holmes: How far is the most easterly point at which is treated foul brood in this province?

Mr. McEvoy: Prince Edward County.

THE MANAGEMENT OF OUR APIARIES AND SHIPPING BEES BY RAIL IN SUMMER.

The following paper was read by Mr. Cornell in the absence of the writer, Mr. C. W. Post, Murray, Ont. During the last few years establishing out apiaries has become a necessity with the specialist, not so much for the reason that certain localities have become overstocked with bees, but from the fact that it is very difficult to find a locality with all conditions favorable for a continuous flow of nectar from the beginning of the clover bloom until the closing up of buckwheat and other fall flowers. In this article I will go no further than what I have learned from actual experience. My home apiary is a poor locality for white honey, but one of the best for buckwheat and fall flowers. For that reason it is for me a necessity to establish out apiaries. My first attempt was in 1885, hauling the bees and surplus arrangements on spring wagons. This I continued for five years, and during that time, with the increase in numbers, it became a long, tedious job to handle them on wagons. As I am living on the line of the Central Ontario Railway and only a short distance from Weller's Bay Station, a thought suggested that it could be managed to handle them in car loads. So in 1890, I began to a

sort of experimental way to handle bees in car load lots; and, from the experience gained in the past four seasons, I have learned and know that bees can be successfully shipped by rail in full car load lots in the very warmest weather. I will give in detail my system of management, from preparing them for shipping in May and early in June until they are returned home the first of August, and if there is a better or different way from mine I hope it will be brought out in discussion, that we may all receive a benefit from it.

I use and prefer the nine frame Langstroth hive with bottoms secured with Vandusen clamps. The sides of hives are cut to project one-half inch beyond the front end of hives. Each hive is furnished with wire cloth screens framed with one-inch straight grained basswood. The size of the top screen is the outside dimensions of the top of the hive, and the bottom one is one-half inch longer, or just the length of the sides of the hives. It also has a one-inch screw in each side to correspond with the one in the bottom board.

To prepare them for shipping, take off the bottom boards and put under the screens—wire cloth up—and with a hammer drive the clamps on solid and sprig in a one-inch wire nail behind them, then nail on the top screens—wire cloth up—and, after they are done flying in the evening, put on the entrance sticks which are cut three eighths of an inch in thickness by just the length of the ends of hives, so they fit between the sides of hives and fit down snug on the ends of the screens. Being thus secured, if the screens get shifted, the bees cannot escape.

I ship my bees in a stock car and place them with the combs running lengthwise of the car. The first tier is placed on 2x4 scantling, which allows ample ventilation below. The next tier is placed two feet above them on 2x8 plank resting on the sides of the car, spaced so that the ends of two rows of hives rest on the planks, leaving the bottoms of hives unobstructed with an upright in the centre and above that is the third tier arranged in the same way. Shipped in this way, one end of a car holds 180 colonies, while the supers, sun-caps, stands, etc., occupy the other.

I run my bees north from twenty-five to forty miles, and they are confined in the hives forty-eight hours. During this time they require a large quantity of water, which is given them by means of a fountain pump.

I much prefer locating my apiaries close to a station as I have done for the last two seasons, as it requires no handling on wagons. On arriving at our destination, and the car is placed right at the yard, we first unload and place the stands, then place the bottom boards on the stands. Next comes in the sun-caps (each sun-cap holds a queen excluder and honey board). Now we are ready for the bees. One man carries them to the car door and two other men set them on hand barrows and carry them to the stands on which they are placed, and, if the sun is shining, a sun-cap is placed on crosswise. By watering them well as unloaded, it is better not to liberate them until after sunset as it prevents them from mixing. After liberating, put on the sun-caps and leave them till morning. The next day we take off the top screens and, if the honey flow is near, and colonies strong, put on the top stories and fix them all up, but I don't put on the queen excluder until honey begins to come in freely. Now, as there is seldom any shade in these out apiaries I manage them as follows: I prefer in summer to have the hives front north-east so that during the hottest part of the day the sun strikes the back ends of the hives. But if the lay of the land does not admit of that, set them any way. I also leave the screens under the hives during the summer, and if the weather is very warm, I raise the back ends of the hives on half-inch blocks which allows a free circulation of air under the cluster. They cannot hang down to the bottom boards and obstruct the ventilation, but the cool air passes under the whole brood nest and they are perfectly contented. If very hot, I raise the back ends of the four-inch sun-caps and slide them forward till it rests on the honey boards, which allows a circulation over the honey boards, and, added to this, all hives painted dead white, the melting of combs and bees uncomfortable from heat is a thing of the past.

I believe that our apiaries can be run more profitably for extracted than for comb honey (at the present prices) therefore I make a specialty of the former. For a number

of years I have furnished each hive with two top storeys, eight Langstroth frames each, but I believe we can get better ripened honey by using one set of combs above the brood nest; but at the same time I want two sets in case of emergency. I begin to extract when the combs are about two-thirds capped and take them clean as we go. With two smart boys to carry combs and draw off honey, extracting is a very short job compared with doing the same work ten years ago.

I have used nearly all kinds of extractors but I now use and prefer the New Gould Reversible Extractor. If there is one as good I never saw it. I extract, and keep the different grades separate. When basswood begins to fail, everything is cleaned up and the bees prepared for moving. At the last extracting I place five sixteenth inch strips of wood across the ends of frames in the top storeys, take off the queen excluder and set the top storeys back on the hives. My top storeys telescope over the hives three-quarters of an inch and a wire nail is sprigged in each side to hold them together, then the screens are placed on the top of hives and in the evening after they are settled down, tack on the entrance sticks and they are ready to load on the car. They are placed in the car as before, but only two tiers high, as the top stories take up the place. At this season of the year colonies are very strong and the weather warm. They must have plenty of water, but the old adage that "A little too much is just enough" will not apply here, for a little too much is as dangerous as none at all. Never water unless they cluster on the screens; then spray them lightly but often, and they will soon settle down between the frames. If you give them too much and get them steaming, the game is up.

When they arrive home, they are drawn on a large spring wagon to the yard and set on the stands without the bottoms, and the sun-caps placed on crosswise to give thorough ventilation. After sunset they are liberated and the next day, if the weather is favorable they will be working on the buckwheat as briskly as though they had never been moved.

I intended to say something on overstocking, but I find after getting my bees took home that I have already said too much and I will leave that subject for some future time.

Mr. McEvoy: I think, without any exception, Mr. Post is one of the best bee-keepers we have in the province.

Mr. Gemmell: I must say that Mr. Post's paper is an excellent one. I have moved some bees in wagons, by putting only a screen on top. When I moved my bees it was generally to take advantage of the fall flow. If you drive them home late in the fall very little ventilation is required. If you have bees in warm weather you want lots of ventilation. In order to keep the frames from moving, a nail is driven down through, and, as soon as the wire cloth screen is pressed down on the top, it keeps them firm. I take a piece of twine and fasten them firmly. The binding twine seems to fasten them sufficiently for any ordinary moving.

Mr. Alpaugh: Are those little nails sufficient to keep the frames from flopping?

Mr. Gemmell: No; something is required underneath, if moved a great distance, or even on the cars.

Mr. McEvoy: Are those five-sixteenth strips to keep them from moving?

Mr. Gemmell: Those remarks are in relation to the hanging frames.

Mr. Jones: Have you prayed your bees in going out?

Mr. Gemmell: No. I generally move early in the morning or late in the evening. I have at times taken an ordinary whisk broom and sprayed them on the top.

Mr. Cowan: I have had some experience in moving bees by rail, and if anyone had told me the amount of bees they could get up in the car I would not have believed it. They were put in a box car. I moved some bees a distance of about thirty miles. There was a good deal of shunting and bustling of the cars. When about sixteen miles from here I looked at the bees. They were not over-heated at that point. When the train

reached Lindsay, there was a good deal of bunting again, and when I came to open the car door, the blast of hot air that struck me was something wonderful. A great many of the bees were scalded. That was about the 20th of May.

Mr. ALPAUGH: I never shipped bees but once on the cars, and that time I had a little muss. They got heated. For moving bees on a wagon, I have always got along very well with top ventilation, that is if you raise the screen up about one and three-eighth inches from the top. I make the frame of which the outside measure is the width of the hive, sideways. The end pieces of the frame are deeper than the side pieces, so that they come down on the hive and sit on the frames. The screen is tacked on the top of this. To prevent the screens from moving, I put two heavy screws through the end of the frames down into the hives. At the entrance I put on a screen the full size of the entrance.

Mr. HOLTERMANN: We do a good deal of shipping of bees. We ship bees as fa as Prince Edward Island and the North-West Territory. They have gone to Regina by rail and two hundred miles by stage to Edmonton. We have yet to ship a colony that has been lost. The way we do it is this: We take the colonies in which the combs are not perfectly new; that is, if you are selling bees, take a colony where they are not new. About the top of the hive you must use your own judgment as to the season, strength of the colony, etc. Nail a board across and on top of the frames a part of the distance over the top in the front and rear wire cloth raised to form a porch. We cover the entrance with a sort of a cage, to prevent clogging.

Mr. MCKNIGHT: If the question before us warrants us in going into the discussion of shipping bees by other than rail, I have some experience. I quite agree with the gentlemen who have advocated careful preparation when they are to be transported by rail, but I do not at all agree with those who give so much preparation to transhipping by wagon. I used to believe as they, and I used to practice my belief by consuming a good deal of time in the preparation. I have moved bees for several years now, and, whether with the extra preparation or without it, I never knew yet that I have lost ten bees. A good deal of this preparation is unnecessary, and a good deal of the ventilation that is given may be done without. I use the "Simplicity" hive, and they are bevel edged. I got frames made just the same as the frames of the honey board, but 2½ inches deep, so that there would be a space. I no longer use these. I no longer use any wire cloth in shipping my bees. I no longer use any preparation in staying the frames—they never get out of order, unless the hives are new. I confine my bees always about fifteen hours without any upward ventilation, and with very little bottom ventilation, in the early summer and the fall. I enclose them and secure them close; that is all I aim at—to keep them in. I start them off early in the morning. They go about fifteen miles and the roads are pretty rough.

Mr. PETTIT: You say that you do not take any pains to prevent the frames slipping out of place and that they do not slip. Do they hang on supports?

Mr. MCKNIGHT: Yes.

Mr. HALL: Mr. McKnight is perfectly right in moving bees at the time he does and how he does it, but these bees are to be moved in hot weather. I do as he does at that time of year, except that I have a breathing space at the entrance. I would use the directions given in that paper at the time stated there.

Mr. MCKNIGHT: I only recommend it being done in that way at the time I do it.

Mr. HALL: Perhaps your bees have a little knack of building brace combs? At the time of year you say, they will travel in that way. So far as you have gone you are all right.

Mr. MCKNIGHT: My experience is that bees are very quiet in moving.

Mr. HALL: My experience is that I have no comb, mussed honey or dead bees if left unattended.

Mr. PRINGLE: It all depends. Bees can be shipped as far as Nova Scotia. When I shipped in cool weather I took the same precaution that Mr. McKnight did and they

went through safely, but to ship bees a long distance by rail in hot weather they must have plenty of ventilation at both top and bottom. Bees can be shipped successfully, as Mr. McKnight has said, but at other times it would not be a success. I simply have an adjustable entrance—a zinc entrance. I slip the zinc out and nail a piece of wire cloth on. That is all I give them below. In very hot weather I have shipped to Nova Scotia and they went through safely. Two or three colonies will go by rail in a car safely, if fixed up in a certain condition, while if there were a lot of bees they might perish. When you have a lot they must be carefully attended to.

Mr. PETTIT: Mr. Atchley throws cold water all over the hives and inside of the car. This water, in warm weather, will create a very great ventilation. It takes off a great deal of heat. That is my point.

Mr. MCKNIGHT: I put a saturated sponge in mine.

Mr. COUSE: We had to take eighteen or twenty colonies and we loaded up a waggon. We had to take them some distance. It was in August. We put wire cloth over the frame and a wire screen over the entrance. The colonies were strong, but when we got to the end of the nine miles which we were going, there were not enough bees to spread all over the wire top—the rest were all smothering. We took off these screens and they all went out and never came back.

Mr. GEMMELL: The ones that I lost in the very same manner, were all clustering at the top, and they were sticking out their tongues. Once I opened the hive the bees came out in a cloud.

Moved by Mr. MYERS, and seconded by Mr. ACHES, that the thanks of this meeting be tendered to Mr. Post for his paper. Carried.

QUESTION BOX.

Q. Does the system of managing bees, known as the "Alpaugh system," do away with the swarming, or is the swarming more under control than otherwise?

Mr. ALPAUGH: Yes; it does.

A MEMBER: Are the bees at the end of the honey flow in proper shape for winter?

Mr. ALPAUGH: Probably not.

A MEMBER: Will we have more or less drone comb than by the other management?

Mr. ALPAUGH: That is a question that is to be decided yet.

A MEMBER: More or less increase?

Mr. ALPAUGH: Less. I suppose this is the system that was talked about a year or two ago, which I do not practice myself now. When I first thought of this system, I was wintering inside. They did not seem to have time to breed up, and when the flow came on in the middle of June, they had not time to brood up sufficiently. Now I am wintering entirely outside.

Q. At what age is it desirable to supersede queens?

Mr. HALL: At the age the workers decide on. At the age the daughters of the queen decide that their mothers should be superseded.

Mr. CORNELL: Some queens will be good at the end of three years—too good to supersede.

Mr. MCKNIGHT: Kill them off at two years. You will get a bigger crop of honey.

Mr. MYERS: Do you ever find bees allowing the queens to live until they are two?

Mr. HALL: Yes, I do; but it does not answer to kill our queen bee because she is so many years old.

Mr. Corse: I would prefer to have young queens. I find in looking over colonies in the fall that I have more young bees than I would with older queens.

Mr. Alpaugh: You can hardly supersede queens where there is a fall flow, but provided you live where you do not get any fall flow, I believe there is something to be gained by killing the queen at the end of the second year. Kill all your queens after the flow is over, say about the first of August or a little later. Kill them off. I have practised this only a very little, but what I have done is successful.

Mr. Hall: When Mr. Alpaugh is twice the age he is now, he will alter his opinion.

Mr. Aches: Select a good queen from a good stock. By all means select a young queen. I approve of the practice for one who understands the business.

Mr. Pettit: It is a mistake to make a practice of destroying your queens at a year old, indiscriminately. Bees supersede their queens oftener than people are aware of. The bees do the selecting. They know when she does her work and they attend to that matter and supersede her if she is not up to the mark. I am not sure that you are going to raise as good a queen at a time of the year when there is no honey flow, as the bees will raise when they want to do it. Another point—you follow that practice right on for a number of years and the bees become habituated to it, and after a while they get out of the way of watching to supersede their queens, until they lose that instinct, so that they would not be as careful to supersede their queens, hence we would deteriorate the stock of bees. If you allow the bees to do it themselves the strain of queens that live long perpetuate that strain, so that we keep our bees as good as they were. The feeling now of killing queens is not as strong as it was at Walkerton, and it will be less in five years.

Mr. McEvoy: If I had to leave it to the bees I would kill at one year.

Mr. Hall: I have a queen four years old last spring. I intended killing her at the end of the honey flow, but when the time came I drew back.

Q. Is it desirable to exclude drone comb from the brood chamber?

Mr. Pringle: No; it is not desirable to exclude it altogether. I prefer giving them a little.

Mr. Gemmell: Would you prefer giving them some, provided you gave them sheets of foundation.

Mr. Pringle: They make it themselves. They have it anyway.

Mr. McEvoy: I have not got six inches of drone comb in ninety hives. I have not got any drone comb that I know of, but of course they work in a little piece somewhere.

Mr. Pettit: You want a lot of drone comb in every hive. What is a lot? I would say at least one-tenth. I would not care if it was one-eighth of all the combs in the hives. The bees want drones and they will have them. You give them the beautiful combs and they are going to mutilate those combs. They spoil the combs. Your bees are restless. If you give them the drone comb to start with they feel happy from the very start. Let your drone comb be placed on the outside. I have twelve combs in my hive. I don't believe you will have as much swarming, because if there is discontent it will engender swarming.

Mr. Aches: I believe that circumstances alter cases. We do need drone comb. Where would you put it?

Mr. Pettit: In the brood chamber.

Mr. Pringle: I believe there ought to be a little drone comb in every brood chamber, about from four to six square inches.

Mr. Aches: Do we need it in our extracting cases? Is it profitable there? Do you think it well to have some on the upper cases?

Mr. Alpaugh: I am one of those who believes, along with Mr. Pettit, only I go still further than he does. It is not desirable to exclude drone comb from the brood chamber.

They want it there, but not much. I give from one to two frames. Those drone combs do not seem to do any harm. Drones are all right in the hive, and probably they won't breed but once. There is this about having drone comb in the lower storey. I have super after super filled with drone comb. They fill it up if they have all the drone comb they want.

REPORT OF COMMITTEE *RE* FREIGHT RATES.

The following written report was made by Mr. McKnight to the Secretary:

OWEN SOUND, December 28th, 1893.

S. CORNELL, Esq., Lindsay.

Dear Sir,—In answer to your enquiry as to whether I have done anything in connection with the reduction of freight rates on honey, I have to say I have taken no steps to ascertain whether such can be effected. I have, however, satisfied myself that we have not much to complain of. I have secured a copy of the "Canadian Joint Freight Classification," to which all carrying companies in Canada have agreed. It will be necessary to submit our case at the annual meeting of the representatives of these companies before we can secure any modification in the present classification. Honey in boxes, kegs or cans is now rated first class. Comb honey is not rated. The question is, is there any reasonable prospect of getting this rating lowered? I think not; for the reason that things of a very similar character have the same rating. For instance, castor oil—which is usually shipped in cased tins—is also rated first-class. Syrup, when boxed, is the same, and there is notably as much of both these articles freighted as there is of honey. If honey freights are too high, then both the above articles are too high. Honey in barrels is rated second-class; at best, we can only hope to get extracted honey when boxed or cased, reduced to second-class, and the difference between first and second-class is trifling. The difference between first and second-class rates between Napanee and Windsor (which embraces the western railway division of the province) is only six cents per hundred pounds. Between Napanee and Owen Sound the difference is seven cents, and vice versa. Broadly considering the whole subject, my conclusion is that we have relatively little to complain of. If I should be prevented from being present at the meeting you may present this as the result of my enquiries, as well as my opinion of the situation.

Yours truly,

R. McKNIGHT.

Mr. PETTIT: I think we should pass this matter. All these articles mentioned are very high. If bee keepers would appoint a committee to look after the matter, I have no doubt something could be effected, but maybe not the first year. I am satisfied we pay too much in shipping our honey.

Mr. PARNELL: As I was named as one of that committee I may say a few words. I have been asked by several parties to bring this matter before the Association. I have had no time to attend to the matter, but I do think that something might be done. I have talked to railroad men. I have shown the inconsistency of passing honey in kegs and barrels as second-class and putting the same honey in tins securely boxed, first-class. I argue that the extracted honey in tins, well boxed, ought to go at the same rate as the extracted honey in kegs and barrels. I think it would be worth while to follow it up.

Mr. COUSE: That is just the line I was going to speak on. I think that there is no reason why honey in barrels and kegs should differ from syrup. The railroad men claim that there is such a mess with honey, as a rule. Honey in cans, they say, often leaks. Another thing, if you are shipping honey a great distance at the present time the rail

road companies will make you guarantee the freight. In shipping some honey to British Columbia, I asked what the rate was. He said, "You will have to prepay the freight." It had been previously quoted to me at $4.25 a hundred. He said, "If you will guarantee the freight at the end, I will ship the honey for you." The rate from Streetsville to Vancouver was $4 a hundred. The rate on comb honey is higher.

Mr. HOLTERMANN: I would feel inclined to agree with Mr. McKnight in the fore part of his letter; at the same time there is one important point at least, namely, that it is certainly an injustice that we should have to pay a higher rate for honey in tins than we do in kegs and barrels. It can be done by pressure.

Mr. MCKNIGHT: It is the association of common carriers that classify. They group certain articles into certain classes, so that there may be a uniform rating throughout the country. We know now how honey is classed. If we think it is classed too high, the change can only be made through that association. That is the first place we will have to go to change the classification. The classification, as I understand it, does not necessarily affect the rate. The rate is put by each individual company.

Mr. PRINGLE: Supposing we set out to effect that primary object first—to get the classification readjusted, that is, to get extracted honey in tins, properly boxed—do you think the companies would forthwith put the higher rate on all?

Mr. MCKNIGHT: No; I don't think so.

Mr. PRINGLE: Then we would have secured our object.

Mr. MCKNIGHT: I think it is worth while continuing our efforts.

Mr. PRINGLE: I move that the old committee, or a less number, be reappointed to prosecute the work.

Mr. DARLING: I would rather that some other person be substituted in my place.

Mr. PRINGLE: The President can nominate the committee.

Mr. MCKNIGHT: If I thought I would have to go any place from home I would not undertake the thing. I think all that can be done, can be done from home.

Mr. CORNEIL: Mr. Gemmell, Mr. Holtermann and Mr. Pringle should make a strong committee on that.

Mr. PRINGLE: I would suggest that Mr. McKnight be retained on the committee.

Mr. PETTIT: It required personal attention. One reason that honey has been rated high is because of the price. Show them that it is down to one-half now.

Mr. JONES: I do not think we should incur the expense of going personally to attend to the matter. It can be done by correspondence.

Mr. HOLTERMANN: So far as I am concerned, I will pay my own expenses. I would suggest that the committee named should select one or two of their number to make a personal application.

Mr. ACHES: I move that Mr. McKnight be retained on the committee. Carried.

NEW BUSINESS.

Mr. CORNEIL: I beg to move that Mr. James Fletcher and Mr. Frank Shutt, of the Experimental Farm at Ottawa, be elected honorary members of this Association.

Mr. PRINGLE: It is an important matter, and I have great pleasure in seconding the motion. It will be, no doubt, a matter of utility to us—the association of these gentlemen with us.

Mr. DARLING: I am personally acquainted with Prof. Fletcher, and have been for some years. I have had considerable correspondence with him, and he has taken quite an interest, and has, in connection with myself, carried out some experiments, and I am pleased that it has come up in the manner it has. I shall support the motion. The motion was carried.

Mr. PETTIT: There is one thing that seems to me we are in danger of losing sight of. We want a committee to revise the report of these proceedings, and I will move that the President, the Vice-President and the Secretary be that committee.

Mr. HALL: I think it is a good selection, and I have much pleasure in seconding it.

After some discussion the motion was carried.

Moved by S. T. PETTIT, and seconded by J. B. HALL, that the Ontario Bee-keepers Association now in session assembled, return their sincere thanks to Thomas William Cowan, F.G.S., F.R.M.S., for the interest he always takes in the welfare of Canadian bee-keepers, and especially for that excellent and helpful letter on the so-called "sugar honey," which he sent us in February 1893, and which appeared later in the *Canadian Bee Journal*. Carried.

Moved by R. MCKNIGHT, and seconded by W. J. BROWN, that the best thanks of the O. B. A. be and are hereby tendered to the mayor and corporation of the town of Lindsay for the kindness shown in many ways during our stay in their town, and for their liberality in placing at the disposal of the Association the use of the council chamber. Carried.

The proceedings were then closed.

MEETING OF DIRECTORS.

At a subsequent meeting of the Board of Directors the following items of business were passed in due form:

Mr. S. CORNELL was reappointed Secretary. Mr. M. Emigh was re-appointed Treasurer. The President, Secretary and Mr. R. McKnight were appointed as the Executive Committee.

Mr. A. PRINGLE was appointed delegate to the Central Farmers' Institute.

Mr. R. F. SMITH was appointed as representative to the Industrial Exhibition, and Mr. F. A. Gemmell as representative to the Western Fair.

Two hundred dollars was voted to be distributed amongst the affiliated societies; $20 to be the maximum amount to any one society.

The usual grants of $25 and $10 were made to the Industrial and Western Exhibitions respectively.

Moved by Mr. PRINGLE, and seconded by Mr. MCKNIGHT, that the *Canadian Bee Journal* be given as a bonus to the members for 1894, and that we accept the offer of the publishers to supply it at 65 cents for each member. Carried.

Stratford was chosen as the next place of meeting.

BY-LAWS.

I. This Association shall be known as the Ontario Bee-keepers' Association, and shall be composed of those interested in bee keeping who become enrolled as members by paying the annual membership fee of one dollar

II. A general meeting of the members shall be held once a year and shall be known as the Annual Meeting.

III. The time and place of holding the Annual Meeting shall be fixed by the Board of Directors at their first Board meeting in each year.

IV. The President, Vice-President and District Directors shall constitute the Board of Management.

V. Five members of the Board shall constitute a quorum.

VI. Vacancies on the Board by death or resignation shall be filled by the President.

VII. The officers of this Association shall be elected by ballot, with the exception of the Auditor, who may be elected by an open vote of the Association.

VIII. It shall be the duty of the President to preside at all meetings of the Association, to call for reports, to put motions when seconded, to decide upon questions of order, and to declare the result of ballots and elections. The President, in connection with the Secretary, shall have power to call special meetings when necessary. The President shall be *ex-officio* chairman of the Board of Directors and shall call it together when necessary.

IX. In the event of the death or absence of the President, the Vice-President shall discharge his duties.

X. It shall be the duty of the Secretary to keep and preserve the books of the Association. To call the roll and read the minutes at every meeting of the Association. To conduct all correspondence of the Association. To receive and transfer all moneys received for fees and otherwise to the Treasurer, having taken a receipt for the same. To make out a statistical report for the Association and for the Government. To furnish the officers of county and district associations with forms for organization and annual reports, and to give notice of Association and Board meetings through the press or otherwise.

XI. It shall be the duty of the Treasurer to furnish such securities for the moneys of the Association as the Board may determine. To receive from the Secretary all moneys belonging to the Association and to give receipts for the same. To pay them out on order endorsed by the President and Secretary, and to render a written report of all receipts and disbursements at each annual meeting.

XII. Any county or district bee-keepers' association in the Province of Ontario may become affiliated to this Association on payment of five dollars which shall be paid to the Secretary on or before the first day of June in each year, but every local association so affiliated must have on its membership roll at least five members who are also members of the Ontario Bee-keepers' Association at the time of its affiliation and must continue to have a like number of its members on the roll of this Association while it remains in affiliation.

XIII. Every affiliated association shall receive an annual grant out of the funds of this Association. The amount of such grant shall be fixed by the Board from year to year.

XIV. All grants to affiliated associations shall be expended in prizes for honey shows, or for shows of apiarian appliances, or for lectures pertaining to bee-culture, or for advertising district or county meetings, the distribution of apiarian literature, or in sending delegates to the meetings of the Provincial Association, or for any or all of these.

XV. Every affiliated association shall report to the Secretary of this Association (on a form to be supplied by the Secretary) before the first day of January in each year, which report shall be signed by the President and Secretary of the affiliated association.

XVI. County or district associations seeking affiliation should forward to the Secretary an application according to the following form: "We whose names are written in the accompanying form having organized ourselves into a county (or district) association to be known as County (or District) Association No. —— hereby petition to be affiliated to the Ontario Bee-keepers' Association, and we agree to conform to the Constitution and By-laws of said Association."

Form of application as follows:

Names of those already members of O.B.K.A.	P. O. Address	Fees.	Names of those not already members of O.B.K.A.	P. O. Address	Fees.	Remarks.

XVII. Every affiliated association that neglects or refuses to pay the annual affiliation fee, or neglects or refuses to forward to the Secretary the annual report on or before the date fixed may be deprived of their affiliation privileges by the Board.

XVIII. Should an affiliated association become defunct after the payment to it of the grant from this Association, any unexpended balance of said grant shall be furnished and paid over to the Treasurer of this Association.

XIX. Each affiliated association shall be entitled to the privilege of two representatives at the meetings of this Association, in addition to those who are already members of this Association, and such representatives shall be entitled to all the rights and privileges of members of this Association.

XX. Every delegate from an affiliated association shall furnish to this Association a certificate signed by the President and Secretary of the body which he represents, showing that he has been duly appointed a delegate of such society.

XXI. Each affiliated association shall be entitled to the services of an Association lecturer (when such exercises in each year. Half the expenses connected with such lecture to be borne by the District or county association and half by this Association.

XXII. Districts or counties where no affiliated association exists, for into which an association lecturer is sent by this Association, the whole expenses of such lecture shall be borne by this Association.

XXIII. The order of business to be with the meetings of this Association shall be given, shall be in the discretion of the President, but subject on appeal to the meeting when objection is taken, when a majority vote of the members present shall decide on the objection, and in such cases the vote of the majority shall be final.

XXIV. These by-laws may be amended by a majority vote of the members present at any annual meeting.

SCHEDULE OF DISTRICTS

(1) Stormont, Dundas, Glengarry, Prescott and Cornwall.

(2) Lanark, Renfrew, City of Ottawa, Carleton and Russell.

(3) Frontenac, City of Kingston, Leeds, Grenville and Brockville.

(4) Hastings, Prince Edward, Lennox and Addington.

(5) Durham, Northumberland and Victoria.

(6) York, Ontario, Peel, Cardwell and Toronto.

(7) Wellington, Waterloo, Wentworth, Halton, Dufferin and Hamilton.

(8) Lincoln, Welland, Haldimand and Monck.

(9) Elgin, Brant, Oxford and Norfolk.

(10) Huron, Bruce and Grey.

(11) Perth, Middlesex and London.

(12) Essex, Kent and Lambton.

(13) Algoma, Muskoka, Manitoulin and Parry Sound.

RETURN OF DISTRICT OR COUNTY AGRICULTURAL ASSOCIATIONS FOR THE YEAR ENDING DECEMBER 31st, 18

Members.			Voucher Obtained.		Money Taken.		Statistics of Crops (Fall).					Lectures Delivered.		
Names of those Members (U.E.L.)	Names of those Members (U.E.L.)	No. of Members	Spring	Fall	Fall	Spring	Fall Wheat	Spring Wheat	Barley	Oats	Potatoes	Winter	By whom (U.E.L. or Other)	Remarks

We certify that the foregoing is a correct return of District (or County) Agricultural Association for the year ending 31st December 18

President

Secretary

Dated at 18

BY-LAW IN REGARD TO INSPECTORS, PASSED AT A MEETING OF THE DIRECTORS HELD AT THE ALB. HOTEL, TORONTO, APRIL 23RD, 1890.

I. Be it enacted by the Directors of the Ontario Bee-keepers' Association, and it is hereby enact that the remuneration for the Inspector for foul brood among bees, or sub-Inspector (as the case may shall be four dollars per day, while actually at work under the instructions of the President, and act travelling expenses for railway and stage fare and livery hire.

II. The Inspector or sub-Inspector shall prepare and transmit to the Secretary of the Associatic detailed statement of his work for the Association, such statement to be verified by oath, and to be in hands of the Secretary at least three days previous to the Annual Meeting of the Association.

III. The Inspector and sub-Inspector shall conform to all the rules and regulations of the Associat made for their guidance.

IV. The Inspector or sub-Inspector shall conform to the directions of the President as to disinfect his person and clothing.

REGULATIONS TO BE OBSERVED BY THE INSPECTOR AND SUB-INSPECTOR OF FOUL BROOD TO PREVI THE CONTAGION BEING CARRIED FROM DISEASED TO HEALTHY APIARIES IN CONSEQUENCE OF THE VISITS.

I. It shall be the duty of the Inspector or sub-Inspector to clothe himself in a disinfected suit, m of grey Holland before examining any apiary suspected of having the foul brood disease. If a bee is worn that must have been disinfected also.

II. It shall be the duty of the Inspector or sub-Inspector to wash his hands and face in a solutio corrosive sublimate in water, 1 to 1,000, after examining diseased hives. It shall also be his duty o wash in the same solution all knives, smokers, tools and implements used while manipulating such hi

III. It shall be the duty of the Inspectors to provide themselves with a sufficient number of suit that disinfected garments can be put on in every case before entering any suspected apiary.

IV. It shall be the duty of the Inspectors to disinfect those suits and bee veils by soaking them half an hour in the above-described solution in a wooden tub or earthen crock.

V. It is recommended that the suits above-mentioned shall include hats or caps made of grass li or some similar material, which shall be disinfected with the other articles of clothing.

ANNUAL REPORT

OF THE

AGRICULTURE AND ARTS ASSOCIATION

OF ONTARIO

1893.

PRINTED BY ORDER OF THE LEGISLATIVE ASSEMBLY.

TORONTO
WARWICK BROS. & RUTTER, PRINTERS, &c., 68 & 70 FRONT STREET WEST.
1894.

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FORTY-EIGHTH ANNUAL REPORT

OF THE

AGRICULTURE AND ARTS ASSOCIATION.

1893.

To the Honorable John Dryden, Minister of Agriculture:

I have the honor, on behalf of the Council of the Agriculture and Arts Association of Ontario, to present the Report of their proceedings for 1893, the Report of the Hackney and Clydesdale Horse Associations for 1892, the Report of the Dominion Shorthorn Breeders' Association, the Dominion Ayrshire Breeders' Association, the Cattle Breeders' Association, the Report of the Spring Stallion Show, the Report of the Provincial Plowing Matches, the Report of the Fat Stock Show at Guelph, a list of the graduates of the Veterinary College for 1893, and the Treasurer's statement for 1893.

I have the honor to be,
Your obedient servant,

HENRY WADE,
Secretary

TORONTO, March 1st, 1894

FORTY-EIGHTH ANNUAL REPORT

OF THE

AGRICULTURE AND ARTS ASSOCIATION

OF ONTARIO.

MEETING OF JOINT COMMITTEES

A meeting of joint committees from the Agriculture and Arts Association, the Stock Show Committee, Clydesdale Directors and Presidents of Shire and Hackney Horse Associations was held in Toronto on January 13th, 1893, at 2 o'clock p.m.

The following members of Agriculture and Arts Stock Show Committee were present: N. Awrey, M.P.P., President; C. M. Simmons, Ivan; W. J. Westington; J. C. Snell; J. Sissons, and H. Wade, Secretary. Clydesdale Association: Wm. Smith, M.P., President; Wm. Davies, R. Beith, M.P., Robt. Miller, Robt. Graham, W. D. Sorby and George Davidson; Shire Horse Association: John Gardhouse.

President AWREY took the chair, and explained that the object of the meeting was to hold another Spring Stallion Show at the Drill Shed in this city, and that his committee wished the assistance of the Clydesdale and other Horse Associations for this purpose.

The Secretary then read the following resolution passed by the Clydesdale Association at their meeting in the forenoon.

Moved by ROBT. DAVIES, seconded by ROBT. MILLER, and resolved that the Agriculture and Arts Association be asked to grant the sum of $200, the Prince of Wales prize of $50, and a gold medal towards the prize list for Clydesdales for the coming Spring Stallion Show, the additional amount for Clydesdale prizes to be made up by this Association. The prize list to be prepared and judges for Clyde horses to be appointed by this Association. All expenses of said show to be borne by the Agriculture and Arts Association and gate and entry receipts collected by the same.

Moved by C. M. SIMMONS, seconded by W. J. WESTINGTON, that the terms of partnership as read in above resolution be adopted. Carried.

The prize list of 1892 was then revised, and prizes were increased in Class I., Thoroughbreds; Class II., Carriage or Coach; Class IV., Hackney, and Class VI., Shire.

Moved by R. MILLER, seconded by C. M. SIMMONS, that this Joint Association adopt the single judge system for this year. Carried.

Judges were then appointed as follows:

Class I.—*Thoroughbreds*: Roderick Pringle, Toronto; alternate, F. Grenside, V.S., Guelph.

Class II.—*Carriage or Coach*: John F. Quinn, V.S., Brampton; alternate, E. W. Charlton, Dunerief.

Class III.—*Standard Bred Horses*: D. Willoughby, M.D., M.P.P., Colborne; alternate, Wm. Martin, Binbrook.

Class IV.—*Hackneys*: A. Wilson, Paris; alternate, Wm. Gibson, Denfield.

Class V. and VI.—*Suffolk Punch and Shire*: John Gardhouse, Highfield; alternate, Wm. Addison, Toronto.

Class VII.—*Clydesdales*: By Clydesdale Association, Robt. Ness, Howick, Que.

The following committees were appointed: For collections, Robt. Davies, Robt. Graham and H. Wade. To communicate with Col. Otter and the Mayor of Toronto for privileges, Robt. Davies, R. Miller and H. Wade. To act in case the city does not fix up Drill Shed, N. Awrey, M.P.P., J. C. Snell and H. Wade.

The meeting then adjourned.

ANNUAL MEETING.

The forty-seventh annual meeting of the Agriculture and Arts Association was held at the office of the Secretary, Mr. Henry Wade, corner Yonge and Queen streets, Toronto, on the 9th day of March, 1893, at 8 p m.

The meeting opened with the President, N. Awrey, M.P.P., in the chair.

The following members were present: James Rowand, M.P., Dunblane; J. C. Rykert, St. Catharines; Joshua Legge, Gananoque; James Haggarty, West Huntingdon; W. J. Westington, Plainville; J. C. Snell, Edmonton; William Dawson, Vittoria; Albin Rawlings, Forest; Jonathan Sissons, Crown Hill; R. McEwen, Byron.

The Secretary read the minutes of last meeting of the council held at Guelph, 15th December, 1892, the adoption of which was moved and seconded and adopted.

The Secretary then read communications from L. M. Schell, of Guelph, and two letters from S. C. Boulter, V.S., of Norwood, asking the council to prosecute in cases of parties practicing as veterinary surgeons without diplomas.

The PRESIDENT: I do not see why we should interfere in the matter if the veterinary surgeons do not take action themselves.

Mr. HAGGARTY: Is there not a law that protects the medical veterinary practitioner?

The SECRETARY: No; if a man puts up a shingle with V. S. on it he can be fined for doing so, but he can practice as a horse doctor without being fined.

Mr. J. SISSONS: I think the only remedy they would have would be to form an association amongst themselves and protect themselves and press it upon the Government. They should be protected in some way, but I do not see what we can do with it.

Mr. MCEWEN: Can any man practice and charge a fee for any service without being fined?

The SECRETARY: No; if they find he is taking money he can be fined, but you have got to prove it.

The PRESIDENT: I do not think there should be any statute to prevent a neighbor from doing what he can. It is a question whether we should be parties to preventing a man—a farmer—going to a neighbor who can tell what is wrong and whether we should fine that neighbor or not.

The SECRETARY: It is considered a profession, and professions should have a chance.

Mr. SISSONS: I think they have a pretty good cause, but they ought to be strong enough in themselves.

The SECRETARY: We are the only body that can punish.

The PRESIDENT: But a man that feels aggrieved and the man that commits this cruelty that is described, if he is a professional man he should lodge a complaint. The moment he does so we enter an action.

Mr. SISSONS: You will never be able to get at anyone unless they charge. They get the money.

Mr. RAWLINGS: We have a man who has a diploma, and we also have a man that is not a veterinary surgeon, and the farmers go after the man that has no diploma rather than have the man that has.

The SECRETARY: I think if half of the money that is coming to us should go to the informer this thing would be worked a good deal better.

Mr. HAGGARTY: I think we ought to put it before a committee.

Mr. DAWSON: We have two veterinaries in the town of Simcoe, and a man lives right by us is quite competent in regard to cattle, and I never think of going to a veterinary for them; but in regard to a horse that is a different thing.

The PRESIDENT: I do not think we ought to express anything but what is complimentary to the veterinary surgeons in this province. In cases of disease there is no doubt they are the proper persons to attend to a sick animal, the same as a professional

man attending to a sick human being; but if we become parties to enacting legislation that would prevent a neighbor castrating your calves, or lambs, or colts and your pigs, that simply would paralyze this Association in about six months.

The SECRETARY: Read chapter 11, secs. 34, 35, 36, 37 of 49 Victoria.

The PRESIDENT: I must say if there is any great loss or grievance under which the farmers of the province labor, and they are suffering any injustice from this kind of work, we would soon hear it. The complaints come from professional men themselves. They may have good grounds for these complaints, but there is a law to protect them. They should be their own protectors. Why should they ask us to assume the position of protectors. The moment we assume that position that moment we will become responsible for the costs in failure of our being able to substantiate the charges.

Mr. SISSONS: I would let the man himself find out somebody to lay the information and go on with the suit.

The PRESIDENT: I would suggest the Secretary write to them that we will take it into our serious consideration.

The SECRETARY: I answered him in the tenor you speak of; I told him how he could do it and how the council objected to prosecute.

The PRESIDENT: I would suggest we ask our Secretary to communicate with him, and tell him we have placed the matter before the Board, and that while we sympathize with the veterinary surgeons yet the law protected them, and they refuse to assume the position of informers. I think we should do that; we should not place ourselves in the position to have every man who thinks he has a grievance lodge a complaint against us.

Mr. HAGGARTY: I move that a committee consisting of Messrs. Sissons, Snell and Rowand be appointed to take into consideration the communication received respecting persons practicing as veterinary surgeons as licensed and report to-morrow to this council.

Mr. SISSONS: I move the Secretary answer the party that this matter has been placed before the Association and refer the party to the last section of the Act. Seconded by Mr. RAWLINGS and carried.

The Secretary then read a communication from Mr. C. C. James as follows:

TORONTO, 27th Feb., 1893.

Henry Wade, Esq., Secretary Agriculture and Arts Association

DEAR SIR,—I have the honor to inform you that the following gentlemen have been elected to represent the Divisions named below on the Council of Agriculture for the ensuing term:

No. 9	Division—	Wm. Dawson, Esq., Victoria.
10	"	James Rowand, M.P., Dunblane.
*11	"	Robert McEwen, Esq., Byron.
12	"	Albin Rawlings, Esq., Forest.
13	"	Jonathan Sissons, Esq., Barrie.

Yours respectfully,

C. C. JAMES,
Dep. Min. of Agriculture.

The PRESIDENT: I think it is not necessary to take action in this matter. Mr. McEwen is a member of this Board until the result of this appeal is decided.

The Secretary then read his forty-seventh annual report.

Moved by Mr. HAGGARTY, seconded by Mr. LEGGET, that the report be adopted and printed in the annual report. Carried.

*The election of R. McEwen was protested by Mr. Chas. M. Simmons, one of the candidates.

SECRETARY'S ANNUAL REPORT FOR 1892.

To the Council of the Agriculture and Arts Association of Ontario:

GENTLEMEN,—I herewith present my annual report of business done in this office during the last year.

As registration of stock of different breeds is carried on by us largely, I commence by giving you the numbers recorded last year.

	Males.	Females.	Total.
Horses—			
Clydesdales, Vol. VII	213	232	445
Shires, I	15	4	19
Draught horses, II	33	38	71
Hackney horses, I	13	11	24
	274	285	559
Cattle—			
Ayrshires, Vol. II	167	176	343
Herefords, I	38	47	85
Polled Angus, I	35	50	85
Devons, I	4	8	12
	244	281	525
Sheep—			
Dorset horned, Vol. I	..	..	112
Suffolk	..	..	12
	..	..	124
Swine—			
Berkshires	236	377	613
Yorkshires	277	268	545
Suffolks	9	20	29
Tamworths	19	20	39
Poland Chinas	141	270	411
Chester Whites	159	116	275
	841	1,071	1,912

REGISTRATION RECEIPTS AND SALE OF HERD BOOKS.

For these registrations, with the exception of the Shorthorns, we received in fees the sum of	$2,386 50
For Stud and Herd books sold	756 25
	$3,142 75

SEVENTH PROVINCIAL SPRING STALLION SHOW.

Under the management of the Agriculture and Arts Association and Clydesdale and Shire Horse Association, a spring show of stallions was held in the Toronto Drill Shed on the 9th and 10th of March, 1892, and was very successful. There were 14 entries of Thoroughbred stallions, 16 entries of Carriage or Coach stallions, 12 entries of Standard Bred stallions, 10 entries of Hackney stallions, 5 entries of Shire horses, 36 entries of Clydesdale stallions and 22 entries of Canadian bred Clydesdale stallions, or 115 horses altogether.

FINANCIAL STATEMENT.

Receipts.		*Disbursements.*	
Gates, catalogues and grants	$537 95	Prizes at Horse Show	$1,240 00
Grant for prizes Clydesdale Association	495 00	Expenses of running Show	447 00
		Grant to Clydesdale Association	200 00
	$1,032 95		$1,887 00

Balance paid out by the Agriculture and Arts Association, $854.05.

NINTH ANNUAL PROVINCIAL FAT STOCK SHOW.

This show was under the management of the Agriculture and Arts Association, the Guelph Fat Stock Club, and the Sheep and Swine Breeders' Associations, and was held in Guelph at the new Drill Shed on the 14th and 15th of December, 1892.

Cattle :

10 entries in Shorthorns, 2 in Herefords, 1 Polled Angus, 2 Galloways, 3 Devons and 15 in Grades.

Sheep :

Class 7. 23 entries : Cotswold, Lincoln and Leicesters.
Class 9. 31 entries : Oxford, Shropshire and Hampshire.
Class 10. 25 entries : Southdowns, Horned Dorset or Merino.
Class 11. 27 entries : Grade sheep.

Swine :

Class 12. 6 entries : Berkshire and Poland China.
Class 13. 15 entries : Yorkshire, Chester White.
Class 14. 4 Suffolk, Essex.
Class 15. 8 Tamworths.
Class 16. 16 Grade hogs.

After the exhibition on the second day a sale of College Farm and other stock was made, all of which passed off satisfactorily.

FINANCIAL STATEMENT.

Receipts.		*Disbursements.*	
Grant Sheep Breeders' Association	$435 00	Premiums	$1,439 00
" Swine Breeders' Association	236 00	Expenses running Show	283 70
Gate and entry fees	424 85		
	$1,095 85		$1,722 70

Balance out by Show, $626.91.

LIVE STOCK ASSOCIATIONS.

The following brief reports are given regarding the live stock associations in affiliation with the Agriculture and Arts Association :

Clydesdale Horse.

The seventh annual meeting of this Association was held at the Albion Hotel on the 8th of February last, and was fairly well attended. The members expressed themselves as being well pleased with the report, although hard times and the American embargo on our certificates for crossing the lines had affected the market very much. As stated before, we recorded 445 of this valuable breed during the year. Two hundred members paid their fees and Volume 6 was printed and sent out to members. $495 was paid out for prizes at the Spring Show. A marble clock, value $40, was given to the Hochelaga County Show at Montreal, and $100 in cash divided equally between the Winnipeg Industrial, the Toronto Industrial, the Western of London and the Montreal Industrial. Altogether the results for the year were satisfactory.

Shire Horse Association.

A quorum did not attend the annual meeting, so the officers for 1892 continue in that capacity for the present year. $20 were paid out to the Spring Show for a special prize. There are 338 registered for the first volume. Very few people are dealing in this class of horses in Canada.

Draught Horse Association.

A few members have been added during the past year, and Mr. A. S. McVity is now acting as Recording Secretary.

Hackney Horse Society.

This Society was well established at the March meeting, a constitution adopted and officers appointed. Twenty-three members paid their fees and 24 horses and mares were recorded. $60 were contributed for special prizes at the Toronto Industrial Exhibition.

Dominion Shorthorn Breeders' Association.

Although not in affiliation with the Agriculture and Arts Association, it is intimately connected with it. A third grant of $1,000 was contributed to it to conclude the printing of back pedigrees. They recorded 3,641 pedigrees, for which they received $3,835.25 in fees. They had 458 paid-up members realizing $1,896. They finished printing and sent out to members in the spring the seventh volume of their Herd Book, and nearly finished the eighth volume, which contains the pedigrees recorded in 1891.

The American Government, as they say by the recommendation of the Live Stock Associations, have left the Dominion Shorthorn Breeders' Book out of their list, not allowing animals recorded in it to cross the lines free of duty, although the standard is higher than theirs, which must be regarded as a very unneighborly transaction.

Dominion Ayrshire Breeders' Association.

The sixth annual meeting of this Association was held on the 10th of February last. Several interesting papers were read on Ayrshire subjects, and a very useful debate on these subjects added interest to the occasion. During the year the first volume of the New Series was sent out to the members. There were several fine herds shown and the different fall exhibitions and several new cattle imported from Scotland.

Dominion Hereford Breeders' Association.

The annual meeting has not as yet been held. There are several members, and it is likely to become quite an important association. Eighty-five cattle of this breed have been recorded during the year and they have been well represented at the Show.

Dorset Horned Sheep.

We have recorded 112 of these during the last year. They are making quite a record at our Shows, and are renowned for raising early lambs. They stand the climate well.

Suffolk Sheep.

We have recorded 29 of these during the year; they have not as yet come to this country in any numbers, but they are well liked.

Swine Breeders' Association.

This Association embraces all kinds of swine, and the first volume of the Swine Breeders' Record has been printed by the Agriculture and Arts Association, and 170 numbers were sent out to members of this Association.

Berkshires: We recorded 613 of these during the year. It is a very favorite breed.

Yorkshires: We recorded 545 of these fine animals also during the year. They are great favorites also.

Suffolks: Only 29 of these were recorded during the year.

Poland Chinas: Four hundred and eleven of these have been recorded, but, as was the case last year, most of them are ancestors in the States and have been recorded free.

Chester Whites: Two hundred and seventy-five were placed on record, several of them being franked.

Tamworths: We have recorded 39 of these. A very good showing for the first year.

The second volume of the Swine Record is in the hands of the printers, containing some of the pedigrees of all the breeds above, and will be sent to the members for 1893.

Prize Farms.

In 1892, Group No. 6, consisting of the counties of Leeds and Grenville (2), Glengarry, Grenville South, Lanark (2), Dundas, Carleton, Prescott, Renfrew (2), Russell and Stormont, were visited by John I. Hobson, Mosboro'; R. Vance, Ida; W. J. McNaughton, Lancaster; and F. W. Hodson, London, as judges, and their valuable reports will be found in our report to the Minister of Agriculture for 1892.

Our council at the last meeting thought fit to lop off this branch of its service, and unless it be brought up again at this meeting no farms will be visited this year, and the interesting reports on the qualities of these farms will be missed in our next report. The expenses of the four judges were $392.

Ontario Veterinary College.

This Association granted veterinary diplomas to students who graduated from the Ontario Veterinary College, under the able Presidency of A. Smith, V.S., R.V.S., Edinburgh. The diplomas cost $99.

Plowing Matches.

Four of these were held in the different sections of the province. Districts 1, 2 and 3, under the management of C. E. Edwards, M.P., D. Macpherson and J. Legge, was held near the village of Merrickville, in the county of Grenville.

Districts 4, 5 and 6, under the management of Jas. Haggarty, W. J. Westington and J. C. Snell. The match was held near the village of Stirling, county of Hastings.

Districts 7, 8 and 9, under the management of J. O. Rykert, N. Awrey, M.P.P., and Wm. Dawson. The match was held near Thorold, in the county of Welland.

District Nos. 10, 12 and 13, under the management of James Rowand, M.P., C. M. Simmons and A. Rawlings. Match was held near Mildmay, in the county of Bruce.

All of these matches were successful and cost the Association $600.

World's Columbian Exposition.

At the March meeting of 1892 a committee from this Association waited on the Hon. John Dryden, Minister of Agriculture, and recommended the Government through him to appoint a Provincial Commissioner, naming Mr. Awrey, our President, as a likely person for that office, together with an Advisory Board, to confer with him, to act in conjunction with the Dominion Commissioner, to select exhibits of all kinds from Ontario. Soon after that the Government, with the full concurrence of the Legislature, appointed Mr. Awrey the Commissioner for Ontario, also giving him an Advisory Board, on which two members of our council and myself as secretary have seats. Schedules were immediately sent out amongst the breeders of live stock, and were

loyally responded to by nearly all of our best stock breeders and importers, and Ontario promises to come well to the front next fall. Of entries for horses, we have received 10 of Thoroughbred, 42 Standard bred, 38 Carriage, 96 Clydes, 15 Shires, 20 Hackneys, 6 Suffolk Punch and 10 ponies; total, 237. From these 75 were conditionally passed by the inspectors at the fall shows, but several have to be seen this spring.

Cattle entries: Seventy-two Shorthorns, 21 Herefords, 14 Polled Angus, 26 Galloways, 8 Devons, 32 Jerseys, 19 Holsteins, 60 Ayrshires, 3 Guernseys, and 4 fat cattle; total, 259. Of these, 175 were conditionally passed at the fall show.

Sheep: One hundred and twelve Cotswolds, 63 Leicesters, 50 Lincolns, 94 Southdowns, 78 Shropshires, 9 Hampshire Downs, 24 Merinos, 51 Dorset Horned and 43 fat sheep; total, 523. Of there, 350 have been approved of.

Swine: Forty-one Berkshires, 10 Poland Chinas, 18 Chester Whites, 31 Improved Yorkshires, 18 Suffolks, 24 Tamworths and 10 Essex; total, 152. Of these, 150 have been approved of conditionally.

A few weeks ago our cattle were scheduled from going into the United States, but since then they have so far countermanded this order to allow cattle to go to the World's Fair without having to remain at quarantine, by getting a veterinary's certificate that they were free from disease, so at present there is nothing to prevent us having a show at Chicago worthy of the Province of Ontario.

Office Work.

This increases from year to year as more live stock associations are formed. Five thousand one hundred and twenty-three letters have been sent out, besides prize lists, reports and registration forms in great numbers. Your Secretary, besides visiting the principal shows in Ontario, as Secretary to the Commissioner, also visited the great American Horse Show held in New York in November, where he picked up a great deal of useful information.

All of which is respectfully submitted.

H. Wade, Secretary.

The Secretary then read the Treasurer's Report, also the Auditors' Report, and on motion of Mr. Rawlings, seconded by Mr. Westington, it was adopted and will be found at the end of this report.

The Secretary: Mr. Snell and the Mayor and myself were down to see the Horse Show and we were speaking about obtaining permanent quarters for our annual spring Horse Show, and the Mayor expressed himself as being favorable to the idea, to have it arranged to get a suitable place here given us.

Mr. Sissons: I should say that we appoint a committee to visit Toronto and Hamilton and Guelph with a view to selecting a permanent place.

The Secretary: This is a new idea to the Mayor, as to giving that property down there. I do not know what he thinks of it. This is city property. The Grand Trunk has given it up and it was not in the market before.

The President: I should suggest a committee be appointed to wait on the Fair Association of the city of Hamilton to see what accommodation they could guarantee us for a permanent exhibition. I believe we could get more out of the city of Hamilton in that way, because Hamilton is going to put up the buildings for the County of Wentworth, and perhaps Toronto would, too. If they understood that we would hold a permanent exhibition there, they would put up buildings constructed purposely for this kind of exhibition on the plan of an amphitheatre where the horses could be shown inside, and stabling there where you could take the horses in the depth of winter, and they intend to put them up large enough so in addition to spring stallion shows we could have all kinds of male and female animals for breeding purposes. It is easy of access by rail, which runs right into the grounds.

Mr. Sissons: If the city of Hamilton would give us suitable buildings I for one would go there.

The President: There are two lines of railway which go right to it. We have been negotiating with the city of Toronto for a year.

Mr. Rawlings: Why not appoint a committee to attend on the corporations of Toronto and Hamilton and see which will give the most favorable accommodation.

Mr. Legge: I would move that a committee be appointed consisting of Messrs. Rykert, Rowand, Rawlins and Snell to interview the Mayor and corporation of the city of Toronto, and also visit the Hamilton Fair Association and Guelph for the purpose of enquiring if they could get suitable buildings for the purpose of holding a Fat Stock Show and also a spring show and report at the next meeting. Seconded by Mr. Haggarty and carried.

The Secretary read a communication from Mr. F. W. Hodson of London.

The President: Is it your pleasure our Secretary should communicate with Mr. Hodson and express our willingness to held a Fat Stock Show in conjunction with them upon the same terms as last year.

Mr. Rawlings: I think we should consider that first before we adopt it.

Moved by Mr. Legge, seconded by Mr. Rawlings, that it be handed over to the Stock Show Committee to report when appointed. Carried.

On motion of Mr. Snell, seconded by Mr. Haggarty, it was decided to proceed with the election of officers.

Election of Officers.

Moved by Mr. Snell, seconded by Mr. Rawlings, that Mr. Rowand be elected President for the coming year. Carried.

Moved by Mr. Legge, seconded by Mr. Sissons, that Mr. Dawson be elected Vice-President. Carried.

Moved by Mr. Sissons, seconded by Mr. Westington, that the special committee for striking the standing committees be appointed now, consisting of Messrs. Snell, Rawlings, Legge, Awrey and the mover. Carried.

Mr. James Rowand, the newly-elected President, upon taking the chair, said as follows:

I thank you, gentlemen, for placing me in the position you have to-night. Of course I suppose it is the ambition of every one that is a member of this Board to get at the top of the Board. I do not think I am very ambitious, but as you have seen fit to put me in the position I accept it with thanks. I will do my utmost to be as useful to the Association as I can in my position. I have tried to be so in the positions I have been in before.

Mr. Dawson: I have great pleasure in thanking you for the honor you have conferred upon me at the present time. I have not had any particular ambition for the position, but I think it is an honor and shall try to make it my aim to be as useful as I can.

Mr. Haggarty: I move this Board tender our retiring President the thanks of this Association for the able manner in which he has conducted the business of the Agriculture and Arts Association for the past year. Seconded by Mr. Rykert and carried.

Mr. Awrey: I certainly feel flattered at this kindly resolution on my retiring from the position of President of this Association. As Mr. Rowand says, it is the ambition of every man who is worthy of being called a man, when he becomes a member of this Board at some day to reach the position of President. I have had a great deal of pleasure in presiding over our deliberations. It has been a year of pleasant work, and a year of agreeable work, for I have had the sympathy and support of all the members of this Board. I look back to about four years ago when I became a member of this Associa-

tion, the first time I had the pleasure of sitting at this Board I know that I was looked upon with some degree of suspicion as not being altogether in love with our aims and objects.

Mr. RYKERT: You felt guilty?

Mr. AWREY: No, I never felt guilty, I have been too long in politics ever to feel guilty. (Laughter.) I thought then there was a work of usefulness before this Association if our efforts were directed in the proper channel. I think we have found our proper sphere. I think the people, when they learn the good work that we are doing from year to year, will have increased confidence in the work of this Board. I think the confidence of the people has been strengthened within the last four or five years. We are now holding Spring Shows, Fat Stock Shows, which are receiving the approbation of, I believe, every man in the Province of Ontario. I think we can very well under your direction, Mr. President, perhaps increase our usefulness by enlarging the sphere of our work. I think the time is come now when we can very well at our spring show include all kinds of male animals, not only horses, but of cattle, sheep and pigs. We too can very well have an exhibition of seed grain. One of the most important things, I think, in connection with a farming community like ours is that we should have the best class of seed grain. If we could show the farmers once a year at a place like Toronto or Hamilton or Guelph, wherever we hold our exhibition, samples of seed grain and allow them to buy and exchange as they do in some places, I think we would be doing a good work and would be appreciated by the people. I hope under your management we will increase in influence and that our work will show such results that the people of the Province of Ontario will do as they did some few years ago, look upon the Agriculture and Arts Association as one of the permanent institutions of the province. During this last year, I have had resolutions sent me by the Patrons of Industry, where they made objection to our institution. I think perhaps it is because they have not learned the useful work we are doing, and I hope under your direction during this next year we will convince everybody in the province we have a work before us and we will perform it. I thank you, gentlemen, for your kind expression.

I want to call your attention to one matter which perhaps we might very well consider. Next year there is to be in the city of Chicago a large gathering of all those Associations interested in all kinds of agricultural work. In fact there are to be meetings of all kinds of associations—social, religious and agricultural—and there is a week devoted to each meeting. They have asked us, or at least they ask the Government, and the Government sent the communication to me, asking that all of our Agricultural Associations should be represented at that meeting. Now, I have a suggestion to make. There are some old members of this Board, and I will just cite one of them, Mr. Rykert, for example. He has, I believe, during the long period of his connection with the Association never been a delegate representing us at any of these meetings. I think on account of the work he has done for us that he might very well be selected by this Association in conjunction with yourself, and perhaps one or two others, to attend that meeting to present the claims of this province as an agricultural country, and to enlarge upon its resources, because there will be a great deal of spread eagleism at that meeting from the different States of the American Union. I think it is worthy of our consideration between now and our meeting to-morrow and see if you will take some action in the matter.

Moved by Mr. HAGGARTY, seconded by Mr. WESTINGTON, the meeting adjourn till to-morrow morning at a quarter to ten o'clock. Carried.

The meeting adjourned at ten p.m.

SECOND SESSION.

10th March, 1893, at 10 a.m. meeting resumed, JAMES ROWAND, M.P., in the chair.

COMMITTEES FOR 1893.

The Secretary read the report of the committee to strike the standing committees as follows:

Your committee, appointed to strike the standing committees for the current year, beg leave to recommend the following:

Executive: Haggarty, Legge, Awrey, Westington, McEwen.

Finance: Awrey, Rykert, Dawson, Macpherson, Rawlings.

Stock Shows: Snell, Rawlings, Legge, Sissons, Awrey.

Short Horn Herd Books: Snell, Edwards, Dawson, McEwen, Westington, Wade.

Central Farmers' Institute: Awrey.

All of which is respectfully submitted.

J. C. SNELL,
Chairman.

Moved by Mr. WESTINGTON, seconded by Mr. RAWLINGS, the report be adopted. Carried.

A deputation from Guelph, consisting of Mayor Smith, John I. Hobson, Ald. Hewer, William Hearn and H. Wright, waited on the meeting to tender an invitation from the town of Guelph to the Association to hold its Fat Stock Show in that place.

Mr. HOBSON, speaking for the deputation, said: At the meeting of the Fat Stock Club, a few days ago, the matter was taken up in the direction of thinking it would be well to send a deputation down to meet your body to-day, asking if you would again hold the Fat Stock Show in the city of Guelph. I heard to-day, since I came here, that a deputation has been appointed to further consider that matter. Therefore I suppose there will be no decision come to to-day. I will say very little more than that we are exceedingly anxious that the show should be held in Guelph next year. The Fat Stock Club guarantees to use its very best efforts to try and secure a first class show, as far as our efforts will go. I shall not enter into arrangements and matters of detail, since there will be nothing finally settled. You know the show was a success last year, you know the good accommodation you had, and it is for you to say whether it was satisfactory or not. I will say nothing about the accommodation, because Mayor Smith is here representing the city, and he will speak on that point.

Mayor SMITH: The people of Guelph are so well satisfied with your coming there last year with this show that they would like to see you come again this year. You are all well aware of the provision that was made, the large rink that was secured for the holding of the show, and we have secured the same privileges this year, if you will favor us with your provincial show. I may say on behalf of our people in Guelph, that they were well satisfied with your presence, and we trust you were so well satisfied with the treatment you received that you will be well pleased to come back again this year. We will put forth every effort in our power to make the show a success, and be as liberal as we can consistently be. We think that the counties of Wellington and Waterloo produce about the largest number of cattle for shows of this kind, and Guelph will be more central and more convenient than any other place. I have no doubt other places will be advocating their claims to-day, but so far as we are concerned we are down here as a deputation from the council, stating that we would be pleased to have you come back this year, we providing, I may say, similar accommodation to that we did last year.

Alderman HEWER: I cannot say any more than the Mayor has said. Since you were there last we have made a gallery all around the place. We have it all around except on one side, and the upstairs will be built up by the time you are there, and the facilities will be much better. If you come to Guelph we will do the best we can for you.

President ROWAND : I may say this, the committee that are appointed are appointed with a view to something further than the mere holding of the Fat Stock Show. It is whether a building can be got to hold our spring show as well, our horse show, and we may introduce cattle by-and-bye into our spring show, so the intention of the committee is to find out where we can get the best accommodation of that kind.

Mr. HOBSON : I do not want to keep the time of the meeting. We never can reasonably hope or expect there will be a building in Guelph fit to hold a horse show, and had that city the best building in Canada I do not think you would go there ; but we take the strong ground in this way that Guelph is the best place in Canada for holding a fat stock show.

The SECRETARY : While we are on this subject of my report I call attention to this : In cattle we had thirty-three entries only—in the Fat Stock Show the cattle is the permanent feature of the show. I was going to say to these gentlemen from Guelph, if we go to Guelph this fall do they think we can increase the entries in live stock ? It is absurd to go up there and only have thirty-three fat cattle.

Mr. HOBSON : Guelph had nothing to do with that. I think if blame was anywhere it was because it was not made more generally known earlier in the year what was going to be offered in the way of prizes. This year the breeders in the country are prepared for this and are working up for it. But even now the exhibition will be a little discounted from the fact that this prize list is not out and will not be out for some time.

The SECRETARY : Last year the prize list was out in July. It was out so early they forgot all about it.

Mr. SISSONS : If we are going to have a fat stock show, and we all desire that, this board should let it be pretty well understood that it is going to be held in Guelph this year. In fact I am in favor of deciding to-day. I am heartily in favor of securing much better accommodation than we have in this city for our horse show. I am aware of the fact that Guelph is the fat stock centre of Ontario. That being the case, and as the friends there are giving us good accommodation, we can have very many more cattle there than last year. I think it should be understood at this meeting that we expect a better show there than we had last year, and people in that part of the country will prepare for it.

Mr. HEARN : I do not think you have left much for me to say in the way of getting the show for the city of Guelph. You all know how it is situated, in the centre of the best stock-raising country, especially for stock at that season of the year. Mr. Wade has told us there was a small show of cattle there, as there is no doubt there was. I was surprised to see so few, but the prize list was certainly all over Ontario, and had the show been in any other part of the country I do not think they would have had any more in proportion. It is as convenient for most people, especially the west part of Ontario, to ship their fat stock for show purposes to Guelph as any other part, so it cannot be said from the fact the show being held in Guelph there would have been any more fat cattle in any other part of the province. I cannot agree altogether with my friend Mr. Hobson. I think we can erect a building for the horse show. The Ontario Agricultural College is there and they erected buildings for them, and if the Government would give us some assistance the town would go to a very liberal extent in erecting a permanent building for the purpose of showing horses in the spring and cattle at Christmas.

Mr. LEGGE : The most successful Fat Stock Show we have ever held was in Guelph, and I think that would be a most suitable place to hold the fat stock show the coming year.

Mr. HOBSON : I thank you kindly for the patient hearing you have given us.

The Secretary read a communication from J. H. Parkhill, Secretary of the American Short Horn Breeders' Association of Chicago, expressing regret at not being able to attend the meeting.

Mr. LEGGE : I think this board should be represented at the Fat Stock Show in Chicago by a delegate from this body, and I would move that the President of this Association be a delegate to attend there in November.

Mr. Rawlings: I would move, as Mr. Awrey suggested last night, Mr. Rykert being one of the oldest members of the board here, and never having been appointed a delegate, that he be appointed to accompany the President.

Mr. Haggarty seconded motion.

The Secretary then read the result of the Horse Show held on the 8th and 9th of this month.

Mr Snell reads Stock Show committee report, and on motion of Mr. Dawson, seconded by Mr. Rawlings, it was adopted.

Report of Stock Show Committee.

The Stock Show Committee beg leave to report that they have considered the communication from the Secretary of the Sheep and Swine Breeders' Associations asking whether this council desires to co-operate with those Associations in holding a fat stock show under joint management. The committee recommends that this council authorize its Stock Show committee to make arrangements for a joint show on terms satisfactory to the fat stock committee for 1893.

J. C. Snell,
Chairman.

Upon motion of Mr. Snell, seconded by Mr. Rawlings, the report was received and adopted.

Mr. Rykert: This building upstairs should be fixed . the roof leaks and the ceiling is being ruined.

The Secretary: Mr. Awrey and myself went into the upstairs, but we did not know whether we should turn it into an agricultural hall or leave it as it was. We did not see how we could utilize it in any other way.

Mr. Awrey: We would like to have instructions from the Board. I think if all the partitions were taken out there, that would be a place where such meetings as the Farmers' Institutes could come It would seat two hundred people. It is the only way I think it can be utilized. It is a question in my mind whether it is not a matter of economy to leave it the way it is.

Mr. Legge: I think it would be as well to leave that over to the next meeting.

Mr. Haggarty: I think we should leave it to Mr. Wade and Mr. Awrey to do as they think best.

Mr. Rykert: I move Mr. Awrey and Mr. Wade should attend to that matter, or leave it over to the next meeting

Mr. Awrey: At the Central Farmers' Institute a gentleman by the name of Lawrence was very strongly impressed with the idea of this Association asking for plans or giving a prize for the best barn for farming purposes for an ordinary farmer He was very enthusiastic about it, and it was talked over between him and the Minister of Agriculture. He thought this Association should give a prize He travelled half over Ontario without getting satisfied

Moved by Mr. Snell, seconded by Mr. Dawson, that the Fat Stock Show be held at Guelph.

Mr. Snell: I will say, in support of my motion, that while I think that Toronto would be the most suitable place for the Fat Stock Show, being central, and we might expect a large attendance to make the gate receipts considerable, I feel Toronto will not be prepared to give us the accommodation for a Fat Stock Show this year, but another year we might have the accommodation. People ought to know for a certainty where the show will be held, and that there is to be a show and the place located, and I move the show be held at Guelph. I believe Guelph is a good place to hold a Fat Stock Show, it is the centre of a fat stock country, where more feeding is done than in any other part of the country, the Agricultural College being located there, and I do not think we can do better than that at present

Mr. AWREY : As you know, I am not very consistent as to the holding of the Fat Stock Show at Guelph. It is in my own district, yet I propose to move an amendment which will not have the effect of destroying the possibility of having it at Guelph altogether. My amendment is that action be not taken in regard to locating the show until after the report of this committee who are to wait on the city council of the city of Hamilton and the Stock Association of the same city. With regard to what my friend has said about the necessity of the stockmen knowing we are going to have a show, I agree with him in that ; but we have already announced that we will have a show, and as we intend to have a Fat Stock Show, and I suppose the cattle will fatten just as well if they are going to Hamilton as if they knew they are going to Guelph. I think it is premature to name a place to-day. We cannot make as good terms with these people as with the people of Hamilton, who are going to put up buildings worth $75,000, as they are going to do, and they are going to build them this summer. I do not see why we should commit ourselves to going to Guelph while we might make arrangements with either Toronto or Hamilton. These men will not be so anxious to enter into negotiations if they know one more year will have to pass before they will be in the position of having the show. I move the amendment for these reasons. Just imagine a resolution of this kind passing, and our people then waiting on the council of the city of Toronto. They would say, well, gentlemen, there is no necessity in taking action. You have committed yourselves to have your next show at Guelph. And it would be the same with Hamilton. I move the amendment, not that I feel we may not go to Guelph, but I do it for the reasons I state. The amendment was seconded by Mr. Rawlings.

Mr. LEGGE . I think it would be better to defer appointing the place until the June meeting and get the report of the committee.

Mr. MCEWEN : I am firmly of the opinion that it would be advisable to-day to fix the date and place when and where we will hold the Fat Stock Show. There is no doubt a great many of the exhibitors who are feeding will go wherever that show is held, but there are a great many other exhibitors in the neighborhood of wherever this show is held, would like to know to-day so that they might be preparing their cattle. Some people who have stock will probably go to the top of the prize list while they have stock that is worth exhibiting, and if the show is held in their district, and they know it to-day, they will go on and prepare their cattle, and you will see them in your show ring, and I think the sooner we publish the place our show will be held at the more our exhibits will be. However, I will support Mr. Snell's resolution.

Mr. RYKERT : The sooner we find out a place the better, and if there is any object in passing the resolution of yesterday, it is certainly an object to ascertain where we could have a permanent place. I do not agree with Mr. McEwen. These men have got to fatten their stock if they intend to exhibit at all ; and is there any difference whether they know now or in April or May just where the show will be held ? If we fix it at Guelph now, and that committee goes to Hamilton, they will laugh at us, and if we go to Toronto or London it will be the same way. I think, before settling the place we are going to this year, the committee should see the different places mentioned.

Mr. SNELL : We cannot fix a permanent place this year. There will be only the promise a building is going to be built there at Hamilton.

Mr. AWREY : It depends on whether you enter into an arrangement.

Mr. SNELL : I think it would be all right another year. This has been the trouble every year We have been dealing about this permanent location ten years, and we are no nearer to-day than we were ten years ago ; and it has been a source of uncertainty and suspense to the breeders throughout the province every year, and they are anxious that should be done away with.

Mr. AWREY : About Mr. Snell's last remark, I do not think the breeders are so particular as to knowing just where the show is going to be, but they are particular whether there is going to be one, and when it is to be. We have already fixed that we are to have to have a show, and the day ; the breeders know all about it, and

there is no uncertainty. They can feed as well knowing we are going to have a show, and knowing the date, as well as if we fixed the place where the cattle had to stand.

The SECRETARY: I think they made quite a point about this committee appointed yesterday. Now, let this Board hurry up this committee to wait upon these places and empower the stock committee at their next meeting to settle the place contingent on the answers from these different cities, and then you can call this meeting for the joint show, and without very much delay if they hurried up.

Mr. SNELL: It takes months to get a satisfactory answer from these cities.

Mr. SISSONS: I certainly concede that the mover of the amendment made a very strong point in regard to delay, in view of the fact that a committee was appointed to wait on gentlemen interested in the city of Toronto and Hamilton and Guelph, but I agree with the mover of the motion, Mr. Snell. There is not the slightest probability that any place will be arranged for, except Guelph, this year, and we must remember this fact, that the Guelph people went to a great deal of trouble last year to accommodate the Fat Stock Show. Some gentlemen say they did that for themselves, but they did a good thing for this Association, and Mr. Awrey himself admits the show will be held there this year. I believe it, and every member of this Board does, I think. And I think no other city or place has offered us any inducement so far. It is true they are doing something in Hamilton. They have never made us or offered us any inducement to go to their city with our Fat Stock Show. I think Guelph has done so. It is the centre of the stock industry in the Dominion at present, and they are anxious to have it there. They have offered us good inducements to go back this year, and in view of the fact we all believe we would go, I would like if we do not settle it now, to settle it within a month at least. However, I will support the original motion.

Mr. WESTINGTON: In the event of deciding now we are to go to Guelph, it would assist to prevent the mayors and councils in offering inducements to go and hold our exhibition either at Hamilton or at the city of Toronto. They probably would not have the same interest in the matter, and I quite agree with Mr. Awrey that it will not prevent the stockmen from preparing their animals for exhibition. I believe it would have a tendency to bring out a better exhibit. The people around Guelph and Hamilton and Toronto will be preparing their stock for exhibits, not knowing but what the exhibition might be held there. However, whenever it would be decided where it should be held, they could easily move their stock to any of these central points.

The PRESIDENT: My own opinion is that we should settle this question to-day about where we are going to hold the show. My experience in erecting buildings is that they cost perhaps $100,000, and they are not built in two or three months. The money has to be voted by the people yet, and we have all negotiations and arrangements to make before it should be submitted to the people, and the summer will be gone before this will be settled by Toronto or Hamilton. It may be ready for our next spring show—I think that will be as soon as we can hope for it—and I think our show will be injured by deferring. I think our prize list should go out by May or June. It is not necessary the bills of the show to be printed until near the time of the show, but I am strongly of the opinion that we should settle that matter to-day. I think we will have to go to Guelph, and we have all the arrangements to make. We have the Swine Breeders' and Sheep Breeders' Associations; they are offering us the same terms as last year. All things point in the direction of there being a successful show there, and I think we had better not disturb that.

Mr. AWREY: I think we are inconsistent if we appoint a committee to wait upon these two places and then deliberately by resolution decide that we will go to Guelph. I would laugh if I were a member of the city council. They would say "Gentlemen, wait until there is some prospect of your holding a show here." The Fair Association of Hamilton have already expended $75,000; they have underdrained the whole place, and

the tracks and stables are built already. They are not people who wait. They have done it all within a year; they have bought the land and paid the cash for it, and it is fenced. It is not one of these things that is just a vision of the future, it is there, a reality. They are going to have a show and put up the building. There is no doubt about it, there is not a question of whether they will or won't; they have decided to put up the buildings. It is something different to the Industrial here in Toronto; it is in the shape of an amphitheatre. At Guelph they made money out of the transaction; we paid for the prizes. They treated us courteously and handsomely as far as that is concerned, but why is it necessary to say to the people of Guelph to-day, and not to-morrow, we are going to have a show. I look upon it as an absurd thing, and with the Sheep Breeders' and Swine Breeders' Associations it does not make any difference to them. They want to go into a show; they do not care where it is—Toronto or Guelph, or Hamilton or Ottawa. We should either rescind the motion about negotiating with other cities, or we ought not to fix the day.

Mr. HAGGARTY: That is my opinion. Why do we want to send this committee to Hamilton or Guelph if we appoint a day to-day? I say the committee would only be an expense for nothing.

The PRESIDENT: The intention of this committee was more in regard to getting a permanent building to hold our spring show in. I think it would be a mistake to leave it away into the summer to fix the place.

Mr. SNELL: For this year there is no probability of having a substantial building.

Mr. RAWLINGS: I would say in the district in which I live the people will go to the show no matter where it is, Kingston or Toronto, or Ottawa or Guelph, they will go anyway. They always do attend, and I do not think the place will keep them back.

The voting resulted as follows: In favor of Mr. Awrey's amendment, 5; in favor of original motion, 4. The amendment was declared carried.

Mr. AWREY: I wanted to ask this Board whether I could get their permission to have the services of our Secretary for some short time this summer in connection with the Columbian Exhibition. I would like to have your consent to have him go with me, as you are aware he has been appointed Secretary of the Commission. He is your Secretary and I required your permission to take him. I would like to know what the opinion of the Board is upon the matter.

The PRESIDENT: How long do you require him?

Mr. AWREY: We require him particularly this spring while I am away; I cannot get there for two or three months.

The PRESIDENT: Do you mean you want to use him here or take him to Chicago?

Mr. AWREY: Take him to Chicago.

The PRESIDENT: Could he be away?

The SECRETARY: The idea would be, I would always be at home at the end of each month to straighten up things. I think I can promise you the work will be satisfactorily carried on, for everything is in good shape, and all our annual meetings are over and there is nothing but the routine work.

Mr. AWREY: There is an invitation to all associations of religions, of agriculture and everything else to have what they call a parliament, and they issued a circular and forwarded it to me. It was sent to the Government, and Hon. Mr. Dryden forwarded the circular the Government received to me. They ask our Agricultural Association to appoint delegates. No association has acted upon it, and I think that it would be well for the Agriculture and Arts Association to send a couple of delegates. The expenses are not going to be very much for a week, and I think our President and Mr. Rykert, who is an old member of the Board, should represent the Agriculture and Arts Association at the Exhibition. I think that a conference of this kind where all the agricultural associations of the entire continent, and the old country too, are going to assemble, that the Agriculture and Arts Association of Ontario should not be unrepresented.

The PRESIDENT: There was a proposition to send a deputation to the Fat Stock Show, and we wondered whether you had any idea whether that would be about the same time.

Mr. AWREY: There is going to be a fat stock show only in connection with the Exhibition, and it is not a special fat stock show at all, it is simply the same as we would have at the Industrial perhaps one class for fat stock. It takes place just the same time as the rest of the stock is being shown; it is only an additional class.

The motion to send deputation to Chicago was carried.

Mr. RAWLINGS: Are you going to take any steps about London? We have a right to show there next year. We have a right to get something from the Association because we gave them all that property, and surely giving them that property we should have something for it. If we do not go to the show I think the least we could ask would be $1,000. It is a large association.

Mr. AWREY: I wish we could get a thousand dollars, but I know just before we negotiate at all just exactly what they will say. They will say, "Gentlemen, you can have the ground this year and hold your Provincial Exhibition." They know we are not going to have a show. If they are sharp business men, as I suppose they are, they will say, "It is your right, take the ground this year." I would be glad to get the thousand dollars if I could.

The SECRETARY: I think they should pay something.

Mr. AWREY: I think they should, too, but you cannot compel them. If you have a committee appointed to negotiate with these people, if we cannot get a thousand dollars, if we can get $500 it would be better than nothing. Mr. McEwen, who is a member of our Board, will take a deep interest in seeing we get justice done, although he is a member of the Western Board.

Mr. HAGGARTY: Why could not this committee that is to look after the buildings see what they can do and have power to act in that matter?

Mr. MCEWEN: So far as that is concerned, being closely connected with the Western Board, I might say if you wish any money consideration from that Society you might as well enter an action in court at once as to expect to get it.

Mr. RYKERT: We had better let it remain as it is.

Mr. AWREY: I think we can negotiate with them in this way: We could say that we reserve our right to hold the Exhibition this year, but if they want it this year we will reserve it for the next year, so that if we wish we can exercise it next year. We should not be deprived for the next four years of having those grounds. A year from now we might want to hold an exhibition there, and if we surrendered our right this year we might demand that they concede to us that we can have it for provincial purposes next year or the year after.

Moved by Mr. SNELL, seconded by Mr. RAWLINGS, that the Stock Show Committee beg leave to report that they have considered the communication from the Secretary of the Sheep and Swine Breeders' Associations asking whether this council desires to co-operate with those associations in holding a fat stock show under joint management. The committee recommends that this council authorize its Stock Show Committee to make arrangements for a joint show on similar lines to those adopted for the Fat Stock Show of 1892.

Mr. AWREY: I suggest to strike out the words "upon similar lines" and leave the committee empowered to make different terms. "Such terms as are satisfactory to the Fat Stock Committee for 1893."

These words were inserted in motion and carried.

Mr. RYKERT: Would not it be well to have a resolution passed to have our Secretary communicate with the Western Fair Board that we give up our claim this year if they will allow us to have the grounds for next year, that it would not prejudice our right next year or any subsequent year.

Moved by Mr. Rykert, seconded by Mr. Sissons, that Mr. McEwen be appointed a delegate on behalf of this Board to attend the Western Fair. Carried.

Moved by Mr. Snell, seconded by Mr. Awrey, that the committee appointed to confer with Toronto and Hamilton in reference to permanent quarters for holding our exhibition be requested to negotiate at an early date and report at once to the Secretary, who will notify the Fat Stock Committee, and that in case of failure to make satisfactory arrangements with either of the above places, they be authorized to locate the Fat Stock Show at Guelph for 1893. Carried.

Moved by Mr. Joshua Legge, seconded by Mr. Westington, that a plowing match be held in the several plowing match districts, and that $150 be granted to each district, and that the directors representing the same be a committee in their respective divisions to superintend the plowing match and select the place for holding the same. Carried.

Moved by Mr. Rykert, seconded by Mr. Legge, that the Secretary be granted leave of absence to assist Mr. Awrey when required by him. Carried.

Moved by Mr. Rykert, seconded by Mr. Snell, that the meeting adjourn to meet at the call of the President. Carried.

The meeting then adjourned.

H. Wade, Secretary.

THE ONTARIO PROVINCIAL FAT STOCK SHOW.

A meeting of the Show Committee of the Agriculture and Arts Association, Dominion Swine Breeders' Association, Dominion Sheep Breeders' Association, and the Guelph Fat Stock Club convened in the Royal Hotel, Guelph, Thursday, June 15th, 1893. The Agriculture and Arts Association was represented by Messrs. Jas. Rowand, M.P., President, Dunblane; J. Sissons, Barrie; J. C. Snell, Edmonton; A. Rawlings, Forest; Joshua Legge, Gananoque; and H. Wade, Toronto, Secretary. The Swine Breeders' Association by S. Coxworth and J. E. Brethour. The Sheep Breeders' Association by Richard Gibson, J. Jackson and F. W. Hodson. The Guelph Fat Stock Club by John I. Hobson, Jas. Miller and Jas. Hearn.

Mr. J. C. Snell was appointed chairman.

Moved by W. J. Sissons, seconded by J. E. Brethour, that the joint committee consist of the members of the Stock Show Committee of the Agriculture and Arts Association, three members from the Fat Stock Club, three from the Sheep Breeders', and two from the Swine Breeders' Associations. Carried.

The Mayor of Guelph then waited on the meeting, and said that he was glad the directors had decided to come to Guelph; that they would provide the new Skating Rink that proved so satisfactory last year; and that if the show was to be held permanently in Guelph they would put up the old Drill Shed which was coming back into the hands of the city.

Mr. Jas Rowand, President of the Agriculture and Arts Association, then entered the room and took the chair that was vacated by Mr. Snell. He also explained to the meeting that they had waited on Hamilton as per resolution passed at the regular meeting, and after an interview, in which they expressed themselves very anxious to have the Fat Stock Show held there, promised to let our Secretary know by the 1st of May their final decision; but as that time had passed without that response the Secretary was authorized to call this meeting here at once. The Mayor then retired.

Moved by J. Jackson, seconded by J. E. Brethour, that the entry fees from the pure breeds of sheep and swine be repaid to the different associations. Mr. Sissons spoke against the resolution.

After the preliminaries were arranged, the following rules and prize list were adopted :

GENERAL RULES.

(1) Entries must be made on or before November 20th, by application to the Secretary at Toronto, who will furnish blank applications on which to specify exhibitor's name and address, with age and description of animal offered.

(2) All animals shown in the pure-bred classes, and also in the sweepstake classes in the pure-breds, must be registered in Canadian records. All animals in the pure-bred classes under one year, when not otherwise specified, must have been bred by the exhibitor. In the grade classes statements naming the number and kind of crosses must be given at the time of making the entries, when possible.

Moved by Mr. F. W. Hobson, seconded by JOHN JACKSON, that 50 cents per head be charged for sheep and 1 swine.

Moved by Mr MILLER, seconded by Mr SISSONS, that the entry fees be the same as last year. Amendment carried.

F. W. Hobson moved that animals which are entered in the regular classes, when entered again for sweepstakes, will not be charged extra, and that to Rule 4 (Butchers' stock, etc., the following addition be made : "This rule shall not apply to animals shown in the pure bred sheep and swine classes." Carried.

(3) The following fees will be charged, and must accompany applications for entry, for which accommodation will be provided : For each head of cattle $2 ; for each sheep or hog, $1 ; for pen of sheep or swine, $1 per entry, where not entered in former classes ; for each pair of fowl or chickens, 25 cents.

(4) Every animal must be entered for competition, giving the name of the breeder and owner, and each animal must be shown in its class.

(5) A card will be furnished the exhibitor at the time of making the entry specifying the class, the number of section, and the number of the entry, which card must remain attached to the animal during the exhibition ; but, in the case of sheep, pigs and poultry, the card must be attached to the pen or coop.

(6) Diligence will be used by the Officers of the Board to prevent injury to or loss of property, but they will not be responsible for any damage or loss that may occur.

ANIMALS.

1. No animal can be removed until the close of the exhibition, except for adequate cause, and then only on the order of President.

2. Stock must be in the stalls or pens on Wednesday, 6th of December, at 10 o'clock a.m.

3. Cattle must be well halter-broken ; no vicious animals will be admitted.

4. Butchers' stock only will be eligible to compete for premiums ; animals that are not to be used hereafter for breeding purposes will be excluded from competition. This rule shall not apply to animals shown in the pure-bred sheep or swine classes.

Resolved, That the Directors of Sheep and Swine, and of Fat Stock Club, be furnished with complimentary tickets, and that the Fat Stock Club pay 25 cents each for tickets to members.

A LIST OF JUDGES APPOINTED.

Pure-bred Cattle. A. J. Thompson, Toronto, Ont. ; alternate, Alderman Crawford, Toronto.

Grade Cattle. Henry Thurlow, Fergus-on-Isle, Ont. ; alternate, J. Alison, Galt, Ont.

Championship Prize. Jesse Dunn, Toronto, Ont.

Long and Short, Classes 8 and 11. John Gibson, Denfield, Ont. ; alternate, Jas. Russell, Richmond Hill, Ont ; second alternate, Jas. Petty, Hensall, Ont.

Middle Wool, Classes 9 and 10. A. Shunston, Blackheath ; alternate, S. Lemon, Kettlby ; second, John Cowsmith, Paris, Ont.

Swine, Classes 13 and 16. Jas. Anderson, Guelph, Ont. ; alternate, Jas. Main, Milton, Ont.

Class 12. Jas. Milton, Milton ; alternate, Jas. Anderson, Guelph.

Classes 14 and 15. J. E. Brethour, Burford, Ont.

Poultry. James Murton, Guelph, Ont.

Superintendent. Herbert G. Wright, Guelph.

The Agricultural and Arts Association pay all prizes in the cattle department. In the Sheep and Swine departments, the Dominion Sheep Breeders' Association and Swine Breeders' Association each subscribe $400 towards the Prize List in those departments, and the Agricultural and Arts Association $675 to each division. The total cash prizes offered for sheep are $850 ; for swine $870 ; for cattle $800. The list for poultry is not yet arranged, but it is understood that the prizes offered this year will be twice as large as those offered last year.

The Guelph Fat Stock Club furnish a building and all accommodation for the exhibits. Entry blanks and full particulars may be obtained from Mr. Henry Wade, Toronto, Ont.

MEETING OF THE COUNCIL OF AGRICULTURE.

September 12th, 1893, 8 p.m.

Owing to the President's absence at the commencement of the meeting, it was moved by Mr. RYKERT and seconded by Mr. SNELL, that Mr. Dawson take the chair. Carried.

Mr. DAWSON then asked for the reading of the minutes of the last meeting. Mr. Wade read the minutes of the meeting held on the 9th of March, and was about to proceed with the minutes of the meeting held on the 10th of March, when the President came in and Mr. Dawson vacated the chair.

After the minutes of the two meetings were read and adopted, Mr. Wade read two letters; one from Mr. Browne, of London, Secretary of the Western Fair, and one from Mr. Dryden, sent him by the Patrons of Industry from Johnston.

LONDON, ONT., July 21st, 1893.

HENRY WADE, ESQ.,
Sec'y Agricultural and Arts Association,
Toronto, Ont.

DEAR SIR,—Your communication, re holding the Provincial Fair at London, was brought before the Board of Directors yesterday afternoon, the first held since its receipt, and I have been instructed to reply stating that it would be impossible for the present Board to do anything to bind their successors in office; the matter will, therefore, be an open question for decision when future application is made.

Yours very truly,

THOS. A. BROWNE,
Secretary.

The SECRETARY said there was something new to bring before the Board; this was a bill sent in for taxes, amounting to $88.39, for Local Improvement Rates.

Mr. JAMIESON explained to the Board that before the last improvements were made on the building he had paid their portion for a number of years; as it was such a small one he never mentioned it; but the Association would not be exempt from Local Improvements now. It was moved, seconded and carried that this bill should be paid.

The SECRETARY then mentioned the expenses of the judges of the prize farms and J. C. Rykert asked if they were paid anything but their actual expenses. It was explained to him that that was all.

Moved by Robt. McEWEN, and seconded by J. C. SNELL, that Mr. Hobson's account be paid.

At this period of the meeting Mr. Jamieson wished to speak, and said: "I come before the Board with what was up last year. The times have been very hard here and business is not what it ought to be, and I really think you ought to let me off heating this building. I really cannot afford to do the heating. I would not come before the Board had business been satisfactory for the last two years. I do not ask much; all I ask is, that you give me justice, as I have asked the last sixteen years."

Mr. HAGGARTY asked what the heating of the building would amount to.

Mr. JAMIESON estimated the cost of heating the building for the season at about $200 or $300. Mr. Jamieson also went on to explain to the Board that rents were low in the city at the present time, and times were a great deal harder than a few years ago, and if they were the same now as ten years ago he would not object to the heating of the building.

The PRESIDENT: I suppose it is a fact known to all that the times are harder; but it is a matter the Board should consider whether they relieve Mr. Jamieson of that obligation or not.

Mr. SISSONS thought the Board could relieve Mr. Jamieson a little, as it was customary to relieve tenants to a certain extent in a case of this kind. At the same time, he

said, "I do not think it was a child's lease; but Mr. Jamieson seems to think he was too hasty when he committed himself to do the heating, and sometimes men have to suffer severely for being foolish."

Mr. Jamieson went on further to explain how he had paid out $10,000 in improving the building; he said, "I have houses on Gerrard street that used to bring me as high as $50 a month, and now they only bring about $35; without exaggerating, rent is from 20 to 25 per cent. less, and I raised my own rent 25 per cent.

The President then asked the estimate of heating, and after a short discussion, it was concluded that the heating would amount to about $40 per month for the season.

Mr. Legge: If we are not using the upper flat, why not let Mr. Jamieson use it? Mr. Sissons thought it was really worth $100 to Mr. Jamieson.

After the discussion it was moved by Mr. Rykert, seconded by Mr. Dawson, and carried, that the Board allow Mr. Jamieson $20 per month heating the building, for the coming season, which would be about seven months, and that he should have the use of the upper flat until rented. Mr. Jamieson thanked the Board for their kindness and left the room.

Mr. Rawlings: With regard to the letter from the Patrons, it seems the trouble all over the country has arisen from us not having a detailed statement. I think a detailed statement would be better to all concerned.

The Secretary said there was a detailed statement, and the matter was passed over with very little being said about it.

Mr. Sissons: There is a little matter I would like to mention. You are all aware of the fact that this province for Agriculture and Arts business is divided into thirteen divisions. We find that there are three gentlemen in each division with the exception of the one I live in—and there are four of us. Three years ago we held a plowing match in North Simcoe for our division, and there was a little strife as to who should have that, and I looked forward for the match in three years; and in good faith, in fact, I am certain the match comes to my division, but, of course, after Mr. McEwen was elected he claims the match for this year. That, of course, places me in a very awkward position. Now unless some other arrangement is made, so as we can hold the two together with Mr. McEwen and myself, I feel as though I ought to have the match in my division this year again, owing to the promise I have made to the different farmers, although I do not wish to place the Board in an awkward position or do Mr. McEwen wrong. Then another thing: I represent nearly half of the province. Now I think some arrangements ought to be made whereby this Board would consider the advisability of allotting the plowing match once in four years to my division with an extra grant of $150. It isn't fair that we have it once in four years and the other portions of the province have it every three years. I may say personally I wish to have the match myself this year, and I think the Board ought to grant either $150 extra or allow it to Mr. McEwen, next year.

Mr. McEwen: I understand from Mr. Wade that it is my turn to take my district, and as it is the turn of my district I do not think my friends would allow me to forego my chances of the grant. I am sure I would be very glad to assist Mr. Sissons out o the difficulty, still I would not like to give away my claims.

Moved by Mr. Rykert and carried, that $150 be granted to Mr. Sissons' district for a plowing match this fall.

The meeting then adjourned to meet at the call of the President.

AGRICULTURE AND ARTS ASSOCIATION.

GUELPH, Dec. 6th, 8 p.m., 1893.

A council meeting of Agriculture and Arts Association, was held in the skating rink.

Members present: Jas. Rowand M.P., Dunblane; James Haggarty, West Huntingdon; J. C. Snell, Edmonton; Joshua Legge, Gananoque; Wm. Dawson, Vittoria; R. McEwen, Byron; and J. Sissons, Barrie; and the Secretary.

President ROWAND occupied the chair.

A communication was read from the Hon. John Dryden, Minister of Agriculture, naming Mr. Wm. Dickie, of Oshawa, as one of the Auditors of the accounts of the Association.

John I. Hobson, of Mosborough, was appointed on behalf of the council.

A letter was read from H. H. Wing, Professor of Animal Industry, Cornell University, asking for sets of herd and stud books.

The secretary was requested to send them. Owing to the absence of three members of the finance committee, Messrs. Sissons, Haggarty, and McEwen were added to that committee, for this meeting.

The report for the plowing match for districts Nos. 10, 11, 12, and 13, was read and handed in by R. McEwen, chairman.

Report for districts 4, 5, and 6, was also read and handed in by W. I. Westington.

The report from districts 7, 8, and 9, was verbally reported by the secretary, who had attended it on the Asylum Farm at Hamilton; and W. Sisson also made his report.

PROVINCIAL PLOWING MATCHES.

DISTRICTS NOS. 10, 11, 12 AND 13.

Mr ROBERT MCEWEN submitted the following report:

The plowing match for the four Districts, Nos. 10, 11, 12 and 13, under the joint auspices of the Agricultural and Arts Association and the Agricultural Societies of North and South Perth, was held on November 10th, about two miles south of Stratford, upon the farm of Mr. James Waldie, in the Township of Downie. Although arrangements had been hastily made—and the event would have been the better of more extensive advertising—yet the number of entries and the excellence of the plowing in every class, including that for boys under eighteen years of age, quite satisfied not only the promoters but also the great crowd of spectators in attendance. Old Gray plows that had been carefully housed for the past ten and fifteen years were brought into requisition, and guided with the greatest precision and judgment, while the work of newer inventions, such as sulkies, was watched with considerable interest.

The appearance of an Indian from the Onondaga Reserve as a competitor, and his really splendid work, nettled some of the older hands to their best form.

The field was a good one in every respect. The proprietor, Mr. Waldie, was generous in his hospitality to both plowmen and visitors, and is specially deserving of their thanks.

The judges, Mr. James Robson, of Birr, and Mr. Benson, of the Ontario Agricultural College, made very satisfactory awards.

Of the $212 offered in prizes, $150 were given by the Agricultural and Arts Association, and the balance was contributed by the North and South Perth Agricultural Societies, and by private subscriptions.

The committee of management were John Idington, Q.C., P. S. Armstrong, N. Monteith, Wm. Crerar, W. W. Ballantyne, J. A. Fraser and Robt. McEwen.

Rules and Regulations.

1. An entrance fee of $1 will be charged to all plowmen.

2. Entries will be taken up to 8 o'clock a.m. on the morning of the match, but competitors are requested to make their entries by the 9th November, personally or by mail, addressed to John Brown, Secretary, Stratford.

3. Each plowman shall draw his number, and the parcel of land having the corresponding number shall be the lot he shall plow.

4. No prizes will be awarded except where there is competition, or at the discretion of the Judges.

5. Furrows to be not less than six inches deep. All the ground to be plowed and judged, and every plowman to perform his work without assistance after the stakes are set, otherwise to forfeit any right he may have a prize. No sticks or paddles to be used. No gauges are to be used in any class except riding or sulky plows.

6. Men who have taken a first or second prize with an iron plow at any previous match in Canada will not be permitted to plow in any but first class.

7. All parties interfering with or abusing the Judges or Directors to forfeit any right they may have to a prize, and be expelled from the grounds.

8. Gambling will not be allowed on the grounds or highway.

9. Plowmen shall commence at 9 o'clock a.m. by a signal from the time-keeper, and shall complete their work by 3.30 o'clock p.m.

10. Each plowman, after finishing, must place his stake with the number on the centre of his land, and remove his team and plow from the land plowed, and immediately report himself to the time-keeper.

11. A copy of these regulations will be placed in the hands of the Judges, and will be strictly adhered to.

12. Should any protests arise, they must be handed in, in writing, to the President or officers before the Judges have given their decision.

The 1st and 6th classes were open to all, the 2nd and 4th open to all but those having taken first or second prizes at any plowing match in Canada, and the 3rd and 5th classes were open only to boys under eighteen years of age.

PRIZE WINNERS.

Class I., Long Plows.—1. Thomas Steele, Avonbank, $20; 2. Ed. Ward, Crosshill, $15; 3. H. J. Jonathan, Onondaga, $10; 4. William Hart, Hampstead, $8.

Class II., Long Plows.—1. Charles Turner, Avonton, $12; 2. John McDonald, Stratford, $10; 3. Wm. Murray, Avonton, $8; 4. W. H. Murray, Avonton, $6; 5. Wm. Morrice, Stratford, $4.

Class III., Long Plows.—1. Thomas Wallace, Avonton, $12; 2. R. J. Ballantyne, Avonton, $10; 3. Arthur White, Avonton, $8; 4. James Gloyne, Avonton, $6.

Class IV., Jointer Plows.—1. Wm. Wahlie, Stratford, $12; 2. Martin Vansickle, Braemar, $10.

Class V., Jointer Plows.—This Class for boys had no entries.

Class VI., Sulky Plows.—1. James Thomson, Floradale, $5; 2. W. H. Stafford, Brantford, $3.

Special Prizes.—Best Shaped Land: Thomas Steele, $5; given by W. Rennie, Farm Supt., O. A. C. Best Groomed Team: Wm. Murray, Avonton, $3; given by Robert M. Ewen, Agriculture and Arts Association. Best Cleaned Harness: 1st, J. McDonald, Stratford, $3; 2nd, W. Morrice, Stratford, $2 given by W. W. Ballantyne.

Districts Nos. 4, 5, and 6,

Mr. W. J. Westington, presented the following report:

Report of the Provincial Plowing Match, held in No. four, five and six districts, consisting of the counties of Victoria, Haliburton, Durham, Ontario, Peterborough, Hastings, Lennox, Addington, Prince Edward, Northumberland, York, Peel, Cardwell and the city of Toronto, held in connection with South and North Victoria Plowman's Association. The plowing match was held on the Farrell Farm, on Thursday October 26th, 1893, three and a half miles east of Lindsay.

The following prizes were offered:

1st class. Men in sod: 1st prize, a sod plow given by Dugald Sinclair, value $20, and cash $22, $42; 2nd, $22; 3rd, $15; 4th, $10; 5th, $7.

2nd class. Men in sod: 1st, a clothes reel, given by Sylvester Bros., value $8 and cash $17, $25; 2nd, $17; 3rd, $10; 4th, $7; 5th, $5.

Stubble class. Men: 1st prize, a plow given by Massey-Harris Company, value $15 and cash $3, $18; 2nd, $12; 3rd, $8; 4th, $6; 5th, $4; 6th, $3; 7th, $2.

Stubble class. Boys: 18 years and under. 1st prize, $18; 2nd, $12; 3rd, $8; 4th, $7; 5th, $6; 6th, $4; 7th, $3; 8th, $2; 9th, $1; 10th, $1.

Sulky plows: 1st prize, $12; 2nd, $8; 3rd, $4.

Rules and Regulations.

1. Plowing to commence precisely at nine o'clock, a.m.
2. Entrance fee for men, $1.
3. Entrance fee for boys, 50 cents.
4. No prizes to be awarded unless there is competition, or at the discretion of the judges.
5. Furrows not to be less than six inches deep in sod, and in stubble to be six inches in depth. Feering in stubble must be split out not less than three inches in depth, all the ground to be plowed and judged, and every plowman to perform his work without assistance after the stakes are set, otherwise to forfeit any right he may have to a prize.
6. No sticks or paddles allowed to be used. No handling of furrows allowed.
7. Men who have taken a first prize in second men at any previous match in Canada will not be allowed to plow in second class men or in stubble.
8. All parties interfering with or abusing the judges or directors to be expelled from the field or fields.
9. As the contract for refreshments has been let, no stands or gambling will be allowed on the grounds or highways.
10. Time allowed for plowing to be at the rate of sixteen hours per acre for sod, and twelve hours per acre for stubble, any person not finishing in time will be ruled out. The plowman will have one crown and one finish. After the two furrows of their crown are up they will gee around and put four furrows on each side of the two crown furrows, then haw around and finish, and on any one delaying the plowman by not being ready to allow them to turn around, the plowman so delayed must be allowed time for such delay.
11. Sulky plows will be allowed to plow in stubble or in sod, or in both classes.
12. Entries to be made on the grounds before nine o'clock in the morning of the match to James Keith, Local Secretary.

Provincial Committee.—W. J. Westington, Plainville; J. C. Snell, Edmonton James Haggerty, West Huntingdon.

Local Committee.—Dennis Scully, J. B. Graham, Wm. Lonsborough, Thomas Thompson, Richard Rich, Donald Jackson, Eugine Shine, James Stewart, Johnston Ellis, Foster Thompson, E. H. Hopkins, Capt. W. D. Hunter, and James Keith, Secretary of Victoria Plowman's Association.

The judges in sod were James Leask, Taunton; Robert Dobson, Mariposa; Foster Thompson, Lindsay.

Judges in stubble, David Carstairs, Bowmanton; W. A. Millen, Menie; John Graham, Fenton Falls.

Prize Winners: The following were the successful competitors:

Class 1. Men in sod (4 entries): 1st, Andrew Millen, Leaskdale; 2nd, John Currie, Woodville; 3rd, John Marquis, Sunderland; 4th, Wm. Graham, Port Perry.

Class 2. Men in sod (6 entries): 1st, Frank Hooper, Saintfield; 2nd, Herb. Graham, Lindsay; 3rd, Joseph Redmond, Peterborough; 4th, Neil Gray, Reaboro; 5th, William Rennick, Lakehurst.

Men in stubble (14 entries): 1st, Alfred Rich, Oakwood; 2nd, William Rich, Oakwood; 3rd, W. J. Graham, Saintfield; 4th, James Rich, Oakwood; 5th, Robert Booth, Lindsay; 6th, Charles Christian, Glenarm; 7th, Robert Young, Valentine.

Boys in stubble (10 entries): 1st, Charles Rich, Oakwood; 2nd, A. Graham, Lindsay; 3rd, L. Williamson, Lindsay; 4th, Joseph Duffis, Peterborough; 5th, John O'Leary, Saintfield; 6th, James Walsh, Saintfield; 7th, George Downey, Lindsay; 8th, G. J. Winn, Doneyville; 9th, L. E. Polland, Blackstock; 10th, Walter Henderson, Lang.

Sulky plows (6 entries): 1st, Charles Code, Linden Valley; 2nd, E. J. Clark, Oshawa; 3rd, Robert Logie, Lindsay.

The day was very cold and raw, and rain commenced to fall about the middle of the afternoon, but notwithstanding the unfavorable weather, there were about 3,000 people on the grounds during the day. The proceedings were brought to a close by reading the names of the successful prize winners in the field, and what pleased all better, each man when his name was called out was handed a sealed envelope containing the prize money he had won, after which the plowmen and committee left the field and came to Lindsay for dinner. This was the first provincial match held in this district. The plowing was good, and a great many leading men visited the fields, not only from Victoria but from the several counties in this division, and all expressed themselves highly pleased with the quality of the work done and the manner in which the match was carried out. We think it will be the means of holding more plowing matches in this section of country in the future. We cannot close this report without expressing our thanks to the warden and members of the county council of Victoria for their $100 grant, and to the township councils of Ops, Emily and Mariposa, for their liberal grants to aid in paying the prizes. It is quite evident that the electorate of the ridings of the county of Victoria are satisfied with the good work this Association is doing in the province, when they, through their representatives, the county and township councils, give such liberal grants.

SIXTY-FIVE PLOWS GOING AT HAMILTON.

From "The Hamilton Times."

At the forty-sixth annual plowing match of the Wentworth Pioneer Plowing Club (in conjunction with the Agriculture and Arts Association, of Ontario), held at the Asylum farm on the mountain top yesterday, there assembled the largest number of plowmen and spectators that have been seen together in the county of Wentworth for the last twenty-five years at least. Possibly in the history of the club one occasion has occurred where more plowmen entered the lists for premiums, but never have there been so many farmers and citizens at a plowing match here as were seen in the fields of the Asylum farm yesterday afternoon.

The weather was delightful; the roads were in grand condition, and everything was favorable. The club had advertized the match throughout the length and breadth of Western Ontario; the competition was open to the world, and as a consequence every township in this section of the province was represented.

The directors of the club were early on the ground, staking out the several lands and preparing for the competition. When fifty parcels containing one-third of an acre each had been selected, Major Walker thought that this would be sufficient; but imagine his and his colleagues' surprise at 9 o'clock when they discovered that there were then some fifteen plowmen unprovided for. But the Asylum farm was fortunately equal to the occasion, and another field was placed at the disposal of the club, and soon sixty-five workers were hard at it. The scene was one warming to the hearts of every true agriculturist, and the four fields in which the sturdy plowmen were engaged were visited by thousands during the day.

The land was in good condition. It was neither too wet nor too dry, but, as one old farmer remarked, "just right for turning a perfect furrow." Each man was instructed to plow at the rate of one acre in eighteen hours, and the several classes were finished about 5 o'clock.

Dr. Russell, Superintendent of the Asylum, and Mr. Thomas Wilkinson, the Asylum farmer, were busy men throughout the day. It was no small task to accommodate so large an influx of visitors. The plowmen were treated to luncheon on the grounds at noon, and all were loud in their praise of the kindness extended to them.

Among those on the grounds were Messrs. Wm. Hendrie, Geo. E. Tuckett, F. C. Bruce, George Roach, E C. Fearnside, J. A. Bruce, James Somerville, M.P. ; Thos. Bain, M.P. ; Jos. Featherstone, M.P. ; F M. Carpenter, M.P. ; Joseph Rymal, ex-M.P. ; Ald. Nicholson, ex-Ald. Dunn, Ald. Webber, S. P. Stipe, C. D. Potts ; Chas. H. Rykert and H. Wade, of the Agriculture and Arts Association ; R Christie, Inspector of Prisons and Asylums ; J. H. Grout, James Hendrie, R. McKechnie, Mayor of Dundas ; Ed. Dickenson, sr., Ed. Dickenson, jr., John Dickenson, Major Walker, John Eustice, John Thompson, W. G. Reid, Reuben Sparks, H. F. Gardiner, Elijah Snider.

After the match was over the competitors gathered in the centre of one of the fields, and President Walker, Vice-President John Eustice, and Secretary Daniel Hamilton, mounted a temporary platform and proceeded to announce the results of the day's plowing. Here is the prize list :

Long Plows—Champion Class.

First Class : 1st, Samuel Smith, Glanford ; 2nd, Walter Tweedle, Saltfleet ; 3rd, Robert Marten, Tuscarora ; 4th, Jesse Jonathan, Tuscarora.

Best beginning in the field : 1st, Samuel Smith ; best finish in the field, 1st, Walter Tweedle.

Second Class, for men, with long plows, who had never taken a first prize at any open match : 1st, D. Smith, Glanford ; 2nd, John Chapman, Onondaga ; 3rd, Walter Young, Caistor ; 4th, Wm. H. Jamieson, Tuscarora.

Third Class, Canadian manufacture long plows : 1st, Samuel Hildreth, Saltfleet ; 2nd, Peter Door, Ancaster ; 3rd, Jacob Isaac, Tuscarora ; 4th, William General, Tuscarora.

Fourth Class, boys under 18 years of age, with long plows : 1st, James Hamilton, Ancaster ; 2nd, Thos. Hammond, Seneca ; 3rd, Wm. Allen, Onondaga ; 4th, Arthur Black, Caistor.

Best beginning : 1st, Jas. Hamilton ; best finish : 1st, Thos. Hammond.

Ins and outs in the field : 1st, Thomas Hammond, Seneca.

Jointer Plows.

First Class : 1st, John English, Ancaster ; 2nd, James Hildreth, Salfleet ; 3rd, Nicholas Elliott, Asylum farm ; 4th, Enoch Thompson, Asylum farm.

Second Class, men who had never taken a prize at an open match : 1st, Willard Smith, Glanford ; 2nd, William H. Smith, Barton ; 3rd, Charles E. Horning, Ancaster ; 4th, Alexander Mitchell, Ancaster ; 5th, Alfred Tweedle, Saltfleet ; 6th, Wm. Swackhammer, Ancaster.

Third Class, boys under 18 years, with jointer plows : 1st, Jesse Green, Tuscarora ; 2nd, Chas. Marshall, Saltfleet ; 3rd, Lewis Horning, Ancaster ; 4th, Edward Marshall, Saltfleet.

Best finish : Edward Marshall ; best beginning, Jesse Smith.

The judges on iron plows were Messrs. W. M. Calder, Thos. Hyslop and Thos. Rice ; on jointers, Messrs. John Beckett, Thos. Beckett and Jos. English.

Secretary Hamilton informed the plowmen that a blunder had been made with regard to the sulky plow class. The plowing had been done all right, but through some unaccountable error the work had not been judged. Mr. Hamilton said that it had always devolved on the judges of the long plows to judge the sulkies, but Mr. W. M. Calder, who has for six or eight years passed upon the jointers, informed the Secretary that he was mistaken : of late years separate judges had been appointed to do it. It was arranged that Messrs. John Beckett, W. M. Calder and James English should go to the field this morning and do the judging. This was satisfactory to the contestants.

The club offered substantial prizes in the 100 yards foot race for plowmen only, and a large number entered. The winners were : 1st, G. Martin ; 2nd, Walter Young ; 3rd, James Johnston ; 4th, W. Moffatt ; 5th, G. Thompson.

The members of the club and the plowmen were invited to the Asylum and were entertained at dinner. The meal was a substantial one, consisting of hot meats and vegetables of all kinds and delicious pastry. That it was thoroughly enjoyed goes without saying.

After dinner there was some speechifying in Dr. Russell's cozy apartments. The genial doctor was asked to take the chair, and Mr. J. H. Grout, of Grimsby, on behalf of the club, made a few remarks of a highly complimentary nature as to the hospitality of the Asylum authorities, and expressing the hope that the plowing matches would be held permanently there in future.

Mr. R. Christie, Inspector of Asylums and Prisons, being called upon, said that he could not guarantee that it would be in the interests of the Asylum to have the match there every year. It was true the farm possessed excellent facilities for the purpose, but but there were other things to be considered. He believed there was nothing tended to develop farming operations more than good plowing. He expressed the great pleasure it gave him to meet so many of his old friends of the north and south ridings of Wentworth. He (Mr. C.) was at the Institution on official business, and was delighted to witness the contest. Dr. Russell had conducted the affair, as far as the Institution was concerned, very satisfactorily, and all seemed to have done their duty. There was doubt as to the propriety of having such a large assemblage at the Asylum. Twice before had the club held matches there; he did not need to remind them that there was an old saying, "Three times and out." (Laughter.) He could not tell which had been most benefited, the Institution or the plowing club. As far as the future action of the Government was concerned he could not speak, but one thing he was sure of in the hands of the men of Wentworth the institution was perfectly safe.

Mayor McKechnie, of Dundas, expressed the pleasure it gave him to be present, and spoke on matters of interest to those who had engaged in the competitions. He was proud to see that the descendants of the aborigines had played no unimportant part in the day's proceedings. He pleasantly referred to something which Mr. Christie had said at table regarding the cost of each meal served in the Asylum—8¼c—and thought if the Mowat Government would have no greater sin laid to their charge than the entertainment of the plowmen they would have little to answer for indeed.

Mr. Joseph Rymal was in capital humor, and made one of his old time speeches. He said the match was one of the best, if not the best, that had ever been held under the auspices of the Pioneer Club. He had been associated with it since 1846. Of the character of the work done he was glad to say that there were fewer inferior lots than ever before. He told of some matches held long ago. There was one when the turn out of plowmen equalled the present match; there was another held on Fiddlers' Green when there was no less than 90 teams plowing at one time. These were exceptional occasions. The average was about 30 to 35 plows. When he looked back over the years he could see that the club had accomplished great good. Manufacturers, too, had improved their plows. If they hadn't the farmers would not have patronized them. He was glad to see that the authorities of the Asylum had opened their grounds to the plowmen; that they had opened their larder as well as their hearts. The obligations were not all on one side. The Government got as much good from having the plowing club there as the club got by holding their match at the Asylum. They got their land well tilled, even if the farmers did get their stomachs well filled in return. (Laughter.) He made humorous allusion to the number of Indians in the matches, commented on the benefits of having a large field of plowmen from a distance, gave personal experiences to prove his point, and warmly eulogized the Secretary of the club, Mr. Hamilton, who had succeeded himself in that office.

Mr. James Somerville, M.P., made a happy little speech. He thought the Government derived just as much benefit as the plowmen from the matches being held on their grounds. He spoke of the excellent work done by the contestants.

Mr. Bain, M.P., also made some appropriate remarks.

Major Walker described the early part of the day's work, the phenomenal success of the match, referred to the grand place occupied by this section of country at the World's Fair, and endeavored to prove that in cereals, vegetables and plowing, farmers hereabouts

are ahead of the rest of the Dominion. He regretted that Mr. Rykert and Mr. Wade, of the Agriculture and Arts Association, had been obliged to go home so early in the afternoon.

Mr. D. Hamilton made a little speech and sang a capital song, the company joining in the chorus.

A resolution thanking Dr. Russell and the authorities of the asylum, and expressing the hope that permission might be granted for the holding of the match on the Asylum farm another year was passed. It was moved by Mr. John Eustice and seconded by Mr. J. H. Grout.

Dr. Russell delivered an admirable address in response. He said if it had afforded pleasure and profit to the plowing club, it had given him pleasure to meet so many very old friends. A good deal had been said about the match being held there permanently. There were two sides to the question. This was a public institution. The plowmen of Wentworth felt that they were entitled to the privilege of holding their annual match there. On the other hand, it must be remembered that the Asylum had been built for the care of lunatics. The farming was a separate department. Their mission was not for encouraging farming. That was a secondary consideration. As for having the match next year, he might tell them they had plowed up so much land this fall that there might not be any for them to do next. He had a great deal of sympathy with the farmers of that section. He had "plowed and sowed, reaped and mowed, and been a farmer's boy." In his time he had plowed with a yoke of oxen. People might boast of art and literature, but after all it was the plow that fed them all. It was the duty of all to encourage the agricultural interests of the country. If the Government continued to be willing, and if there was land to plow, he, for one, would not put a straw in the way of them returning another year. He did not think the asylum had suffered by the visits. On the contrary, he believed they had had an opposite effect. He always made the institution as home-like as possible. Rob it of its jail and penal aspects. There was always a great deal of routine and monotony in an asylum. It delighted his heart and the hearts of his co-workers to mix up with the outside world. The patients, too, enjoyed it. It might have been noticed that many of them were out looking at and deeply interested in the plowing. It roused them up. The plowing club has been looked for for weeks. The influence was for good.

Speeches were made by Mr. James Gibson, Mr. Grout and Mr. Fred. Snider, and the company, at the invitation of Dr. Russell, adjourned to the entertainment hall, where the usual weekly dance of the patients and attendants was in progress.

An hour or so was most delightfully spent here, after which the lights were out, and the visitors hied themselves to their homes, all bearing pleasant memories of the happy moments spent on the Asylum farm.

Notes.

Major Walker is the President of the club; Mr. John Dickenson, First Vice-President; Mr. John Eustice, Second Vice-President; and Mr. Daniel Hamilton, Secretary-Treasurer. They and their brother directors are to be congratulated.

When the officials and reporters were on the platform in the field, one of the wooden horses supporting it gave way and the thing collapsed. Great was the fall, and for a few minutes a struggling mass of humanity was on the ground. Two or three of the fat men resembled capsized turtles in their efforts to regain their footing. Nobody was hurt except Mr. Nelson Horning, who had one of his legs badly scraped. The structure went down a second time a half hour later, but nobody was injured.

Farmer Wilkinson was as proud as a peacock on account of the success of the affair as well as of the model farm with which he is connected.

Innisfil Plowing Match.

Report of plowing match under the auspices of Agriculture and Arts Association and Innisfil Plowing Match Association.

The above match under the patronage of the said Associations took place near Stroud on the farm of Messrs. McConkey & Moore, on October 25th; the day being fine there was a large attendance of spectators. There were thirty-nine entries and thirty-two plows started work a few minutes after 9 o'clock, and although the land was not good, some really first class work was done. The following are the successful competitors:

Class 1: Spencer Crawley, Stroud, $15; Walter Patterson, Stroud, $10; Wm. Clark, Stroud, $7.

Class 2: Edward McConkey, Innisfil, $16; Fred. Wice, Stroud, $7.

Class 3: Wm Patterson, Churchill, $11; Wm. Bennett, Minesing, $9; Robert Stranaghan, Crown Hill, $7; Wm. Chappell, Crown Hill, $5; Thomas Moore, Innisfil, $3.

Class 4: Joseph Geurns, Dalston, $12; Gilmore Keene, Churchill, $9; Wilson Cross, Nantye, $7; Anson Black, Stroud, $5; Hugh Kelly, Nantye, $3, Fred. Quantz, Lefroy, $2.

Class 5: Stubble—G. C. Allen, Churchill, $9; G. W. Reid, Churchill, $7; Andrew Wice, Innisfil, $5; Oliver Peacock, Stroud, $3; Thomas Stewart, Thornton, $2.

Class 6 Walter McCullough, Churchill, $7; Fred. Gobbit, Innisfil, $5; Marshall Wice, Stroud, $5; Eldon Wice, Innisfil, $4; Andrew Boyse, Innisfil, $3; Henry Wice, Innisfil, $2.

Class 7: Single Furrow Sulky Plow—Herb. Black, Stroud, $16; George Green, Innisfil, $5; Peter Knapp, Minesing, $2.

Special Prizes.

Best groomed and equipped team, B. Stranaghan, $2.50; ins and outs, 2nd class, Fred Wice, $2.50; ins and outs, first class, Wm. Clark, $2; best finish, 3rd class, Wm. Patterson, $1; best finish, boys 17 to 20, Hugh Kelly, $1; ins and outs, boys 17 to 20, Wilson Cross, $2.50; best finish in sod, Wm. Paterson, $1.50.

Best finish, boys under 17, Walter McCullough, $1.

Best strike out, boys under 17, Walter McCullough. The judges for sod were Messrs. D. Beath and Ferris.

Directors.—Jas. Rowand, M.P., Jonathan Sissons, J. Fennell, Wm. Paterson, J. Boyse, A. Duncan, Wm. Black, Wm Trebbel, G. Longhead, Wm. McCullough, A. Warner, E. Little, Thos. Irving, Robt. Rieve, R. Neely, F. Wice, Harry Gross and G. Jamieson.

E. F. Quantz, President.
A. Warner, Secretary.

UNITED STATES DEPARTMENT OF AGRICULTURE.

Office of the Secretary.

Washington, D. C., February 21, 1893.

The following regulations governing the inspection and quarantine of Canadian cattle, intended for exhibition at the Columbian Exposition at Chicago, Illinois, are hereby prescribed:

1. Any person contemplating the exhibition at the Columbian Exposition of neat cattle of Canadian origin must make application to the Secretary of Agriculture for a permit to import animals for that purpose. Said application must give the number of animals and a description of each, covering breed, registration number, and at which of the ports hereinafter named said animals are to be imported, and the names of the railroads by which and over which said animals are to be transported to the city of Chicago, Illinois. Said application must be accompanied by a certificate from a veterinary inspector

of the Dominion of Canada where said cattle are located, affirming that no contagious pleuro-pneumonia, foot-and-mouth disease, or rinderpest has existed in said district for the past year; also that the cattle have been examined by said veterinarian and are free from contagious diseases, including tuberculosis.

2. The Secretary of Agriculture, upon receiving an application as above provided, will issue a permit for the importation of neat cattle of Canadian origin to be exhibited at the Columbian Exposition at Chicago, Illinois, and excepting said cattle from the quarantine of ninety days provided by the order of the U. S. Department of Agriculture issued February 3, 1893, upon condition that these regulations are strictly complied with.

3. The said cattle must be loaded at point of shipment into clean and disinfected cars for transport to the United States, and a certificate from the railroad agent must accompany said cars showing that the same were duly cleaned and disinfected in the manner prescribed in the regulations of the U. S. Department of Agriculture of February 15, 1893, entitled "Regulations Concerning Cattle Transportation."

4. All Canadian cattle entering the United States for exhibition at the Columbian Exposition must be loaded and shipped in cars in which they can have proper food, water, space, and opportunity to rest, and said cattle are not to be unloaded until they reach the Exposition grounds at Chicago, Illinois.

5. All cattle coming under the provisions of these regulations must be entered either at the port of Buffalo, New York, or Detroit, Michigan, and on their arrival at either of said ports the inspector of the Bureau of Animal Industry at said port will countersign the permit herein provided for and allow the cattle, if free from disease, to proceed to Chicago, subject to a veterinary inspection at that point.

J. M. Rusk,
Secretary.

The meeting then adjourned to the city hall to the Sheep Breeders' meeting for want of other room, where the President, James Rowand, M.P., gave his annual address, reviewing the work of the Association for the past year.

His address was followed by one from the Hon. John Dryden, Minister of Agriculture, who gave a very interesting report of the victories obtained at the World's Fair.

PRESIDENT'S ADDRESS.

Mr. James Rowand, M.P., delivered the following address:

It was customary in the days of the old Provincial Exhibition for the president to deliver an address at the annual meeting, but as that institution has been relegated to the past, we leave that part of it to the Fat Stock Show. It is now my duty, as President, to address you briefly on the work done during the year, as well as on the state of the great agricultural interest of our province.

The principal work has been holding our spring show of horses, in connection with the Clydesdale Breeders' Association. The show was in every way a success and would have done credit to any province or state on this continent. The object sought by the Association is to encourage a style of breeding which will produce stock that will find a market at any time; and I think the show must have been an incentive to the many farmers who witnessed it.

The Fat Stock Show we are now holding, in connection with the Fat Stock Club and the Sheep and Swine Breeders' Associations, is for the same object. The cattle trade has suffered seriously this year, and has been disappointing to both dealers and producers on account of the scheduling in Britain. One reason was a lack of facility for handling at the port of entry. There has always been a prospect of the embargo being removed, but I think we may abandon that hope, for some considerable time at least, and it is to be hoped that better provision will be made for handling the next year's shipments. It has also stopped the shipment of stockers, and although many farmers think this will result in good, it has hampered many who have not been in the habit of

finishing their cattle; but our farmers must adapt their operations to surrounding circumstances and aim high in breeding and feeding, and markets will be found for all that can be produced.

We have also been holding a number of plowing matches, which seem to be appreciated by farmers generally, and are well patronized.

I regret to have to say that, although we have had a fairly good harvest, prices are so low that farmers have difficulty making ends meet. At present prices wheat cannot be raised at a profit and the acreage sown is growing less every year, and it looks as if Ontario would cease to export wheat. There has been a good crop of hay and a fair one of coarse grains, so that food for stock is abundant and they will winter well.

Dairying has not been as successful as usual in many sections, owing to the dry weather the latter part of the summer. Creameries and cheese factories have to shut down early, lessening the output, and consequently lessening the farmers' returns, but our farmers are plucky and struggle against these misfortunes wonderfully well.

Another thing was the depression that has swept over the United States. Although we have not suffered as much as might have been expected through it, still it has seriously affected our trade. It is impossible that it could be otherwise—a small country lying along side of a large one and having considerable trade going on between them. But I think there are signs of improvement. I might mention other circumstances which were not without effect, such as the partial failure of the apple crop, but I must go on to something else. I was appointed by the Agriculture and Arts Association to visit Chicago and attend the Agricultural Congress held during the third week in October. I attended a number of meetings but was not a little disappointed, everything being so hurried. A large number of papers were read, but there was no time for discussion. There were some excellent papers, but many others were of little interest to me, or would be to most of you. The programme was filled for the whole week from the first and the meeting had to branch out, three meetings sitting at one time, one on roads, one on veterinary service and one on domestic matters. I attended the one on roads. I thought it most important. There were several papers read and some discussion, but the whole was on a class of roads entirely too expensive for our country roads, more applicable to city or suburban roads. One feature that would apply to all roads, was urged by all who took part, and that was the great importance of forming the road bed, whatever material was to be used on the surface. All the papers are to be published in pamphlet form and can be got on application, I suppose, to some of the officials.

I did not confine my attention entirely to the Congress. I took in as much of the great fair as I could in the time at my disposal, and the splendid scenery, the magnitude of the whole thing and the admirable way in which it was handled, are beyond my powers of description, so I will only refer briefly to the part our province, especially, and the Dominion as a whole, took in the fair. I think great credit is due to our commissioners for diligence in securing such good locations for our exhibits. It appeared to me that no better locations could be had. As to the exhibits in all departments of agriculture, we held our own, and perhaps a little more in horticulture, especially in fruit, as we had a splendid display and figured well in the prize list. I did not see much of the live stock, but the awards speak volumes for its success. On the whole Ontario's part in the exhibition was well maintained, and our country is better known than it ever was before, and it must result in advantage to us. I am sure you will all agree with me that, viewed in the light of the stand we took at the Great Exposition, we may well feel proud of our country—for the sun shines on no better—and also of the enterprise of our people.

ADDRESS BY THE HON. JOHN DRYDEN, MINISTER OF AGRICULTURE.

It is rather a late hour for me to give an address, but I think I ought to be permitted to congratulate the city of Guelph on the fact that they have been able to induce the various societies under whose auspices we are here gathered, to hold again the Fat Stock Show in this locality. I believe that the result of the show here this year proves

conclusively that this is one of the best, if not the best, points to be found in the province for holding such an exhibition. (Cheers.) I want also to congratulate the officers of the various associations that have been interested in gathering together the stock we have seen here on the success of their efforts. What we have seen here is really a grand sight. I am very glad indeed to have so good an excuse to leave my office in Toronto and spend a day or two in revelling in the sights to be seen in the rink. I think that everyone who comes here and sees the advance you have made since the show was first held a few years ago, will realize that we are going forward step by step and year by year in the matter of stock raising. I am all the more pleased to come because I am permitted here to meet with representative farmers from every section of the province—the men whose skill, pluck and enterprise have put this province foremost among the nations of the world for agricultural products. (Applause.) I do not know where you will meet with more such men, or where you will be permitted freer intercourse with the men who are making the reputation of this country.

We are just fresh from our victories at the great World's Columbian Exposition at Chicago. It is not too much for me to say—for I am an Ontario man and represent this great province in my capacity here to-day, although I am proud to be called a Canadian—that the results of Ontario's exhibits at the World's Fair are such as to entitle us more than ever to be considered the banner province of this Dominion. (Applause). The fact is, as Mr. Rowand said in his address, that when you looked for Canadian exhibits at the World's Fair, you found everywhere "ONTARIO." So much was this the case that some of my American friends said to me "We have heard of Canada, but what part of Ontario is Canada in?" (Laughter.)

Two years ago, on an occasion similar to this, I took the liberty of stating to you that, as head of the Department of Agriculture in this province, I would be prepared to recommend to the legislature that a liberal grant be given to enable us to do our best at this great exhibition; that personally I believed that what was worth doing at all was worth doing well, and that I did not believe in undertaking work of this kind and half doing it. I was very proud to hear Mr. Rowand say what he did, as president of the Agricultural and Arts Association, in praise of our exhibits. I have failed yet to find a man or woman who went to that exhibition and looked at the exhibits and did not come away feeling more than ever proud of belonging to the Province of Ontario. (Applause).

As the province was to make largely an agricultural exhibit, it was fitting that charge of it should be given to the Department of Agriculture, and also that the man selected to oversee matters in Chicago should be one who had all his life been connected with agriculture. A man was accordingly chosen from among the farming population—a man who had been honored by his fellow farmers by being elevated to the position of president of our Central Farmers' Institute for several years, and who had also occupied the position of president of the Agriculture and Arts Association. Whatever may be our political leanings, I am certain there are none, now that the results have been witnessed, but will give credit to Commissioner Awrey for the judicious way he has managed the whole exhibit. (Applause.)

From the time we commenced operations, I need hardly say that both of us bent our energies to make the thing a success. It did not come about by accident. All those beautiful exhibits you saw there meant that a great deal of labor and effort was being put forth to induce people to exhibit their products and their stock. I am glad indeed to be permitted to realize that it has met with the approval of everyone who has had anything to say upon the subject.

When we went there, it required some considerable pluck for the Province of Ontario—considered by Americans as a bleak, barren waste with a comparatively small population—to present herself in the face of the world and undertake an exhibit in a foreign country, there to be met with the lavish expenditure of money (and it was lavish) on the part of the states of the American Union and some European countries. But, notwithstanding, our exhibitors were prepared to face this, and it is not too much to say that we came out entirely victorious, as I shall show you. (Applause.)

I would like to go over a little of what has been done, for even yet some of us are not able to realize how great our success has been—it has been phenomenal in almost

every department. It will not do for any one to say now that we have a poor country in Ontario, for we have proved that we have a better country than any other on the face of the earth. (Applause.)

In grain Ontario received more awards than any other state or country with the exception of Illinois, whose awards were mainly for corn. Ontario, Missouri and Iowa each got an award for agricultural decoration, or for the style in which the exhibit was put up. We obtained one of the only three awards given. In grain Canada secured 197 awards of which Ontario got 159, the balance of 38 going to the rest of Canada. I believe that the awards to our sister provinces might have been increased, however, had they put forth the same effort as we put forth here. I do not think it is fair to say that we are so much ahead of them, but, unfortunately, they did not undertake the work with sufficient vigor in the beginning and were not able to compete with us.

In flour, oatmeal, etc., Canada secured 24 awards, 16 coming to Ontario and the balance to the rest of the Dominion. In honey the only exhibit was from this province, and we secured 17 awards.

Coming to cheese, it is enough to say that Canada simply swept the board. She just allowed the other fellows enough prizes to make them remember that they were there to be beaten. In cheese Canada received 392 awards, of which 260 came to Ontario and 132 went to our sister provinces.

But I believe we astonished the world more in fruit perhaps than in any other department. People from the south and from California were astonished that we undertook to face them. In fruit Ontario scored thirty per cent. more than any other state or country exhibiting. (Applause.) Canada got fifty awards in the fruit department, thirty-nine of which came to Ontario and eleven to the rest of the Dominion. It will not do now for these people to refer to us as a country of ice and snow, when speaking of Ontario. The whole world now knows that we are a fruit-producing country. Buyers of fruit were there from the south who have been in the habit of getting their supply of fruit in the New York market, and these men have since been arranging to get it in Ontario, because of the proved superiority of our product.

In swine we find that the Province of Ontario was the only province of Canada that undertook to make an exhibit at all in that class, and we obtained one third of the amount of money in the classes represented that was taken by the entire United States. The United States has been called a hog producing country; their hog products are noted. It was a good deal for us to undertake to face them in competition, and I say it is to the credit of our swine breeders that they were able to achieve the results I have given. Ontario secured $1,290 in this department.

In cattle Ontario also comes out ahead. There were only two breeds of cattle, I believe, in which any of the other provinces took a share of the awards, namely, in the Ayrshire and Hereford classes. In all other classes Ontario came to the front and brought Canada through with great honor. For cattle $30,266 was offered in prizes, and of this amount Canada, with 184 animals, secured $6,100, the entire United States getting $24,166.

In the sheep department again our province spoke for Canada, and we have here the same thing to record that we had in reference to the cattle. We went there with 362 animals and obtained 250 awards while the United States got only 193. We obtained $7,503 in money as against $7,828 obtained by the United States. I think this will prove that we have better sheep breeders in this province than anywhere in the United States. (Hear, hear.)

The same thing occurred in the Poultry Department. Ontario was the only province that undertook to exhibit. We succeeded in securing fifty per cent. of the prizes offered and brought away $2,633 of their money, taking about two thirds of the entire money awarded and pretty well frightening them at that.

It should be remembered that the various states added considerable sums to the prizes offered so as to encourage their people to exhibit.

It is not merely that Ontario obtained these awards, but our various exhibits were inspected day by day by thousands of representative people from the whole world over, and that is where we are going to reap the most advantage. In the English papers, which

I see regularly in my office, I continually find statements made as to what we have done. As an advertising medium it is the best scheme we have ever found, and is bound to bring our country to the notice of foreigners everywhere. I should not wonder but that we will have more enquiry from people with a little means in the old country who do not desire to go into the new district, but who could find comfortable homes in Ontario. We have lots of land in the north-west of this province, which you have never seen, or perhaps thought about, that will some day become additional garden spots in Ontario. We have a greater area in this province than any state of the Union, except one.

Besides her agricultural products, Ontario has also shown her mineral products with similar success. For these we obtained 35 awards. New South Wales, which had one of the finest displays in the building, obtained only 27 awards. But as actual commercial value was the test, not merely the beauty of the exhibit, Ontario was still ahead. A good deal of territory that many have hitherto considered as worthless is full of this mineral wealth and will in the future serve to add to the prominence of our province.

The success we have thus met with will, I am sure, be a constant stimulus to our people in years to come—it simply shows us the agricultural possibilities of our country. Some of our people who are running away to the North-west, because far away fields look green, could do just as well here as anywhere else. We have certainly proved by the results of this great show that in these regards we can more than hold our own against all comers. But we cannot afford to rest on our laurels or in the position we have attained. We are seeking (I know that is my aim as head of the department in the province), to increase the value of the products we are sending forth ; but other countries are seeking to do the same thing the world over, and unless we push forward still farther in advance, the chances are that we may yet be left behind in the race. It would never do for our dairymen, for instance, to remain where they are. They must keep pace with the tide of the times or lose all that has been gained. We must endeavor to hold the reputation we have so proudly won.

The values of our products, except it may be dairy products, have now been reduced to so low a point that there is a strong temptation (which I fear may not be resisted by some) to say, "It is now of no use ; it does not matter, it will not pay to make a particular selection of animals in breeding and feeding—anything will do." If there was ever a time when we needed to send the edict forth that the type must be maintained and scrubs must go, it is at this particular time. Times of depression are the very times when we want the best article, for that alone will command the market. I desire that our live stock associations should arouse so much enthusiasm all over the country that our products in this line may be equal to our products in the cheese line. I beg of the live stock associations to work for excellence in the general product and not allow our people at all to slacken their efforts. If it does not pay to produce good animals, I am certain it does not pay to produce bad ones.

These Fat Stock Shows certainly stimulate our people to do better, because they keep before them proper ideals towards which they ought to aim. We had a splendid paper this morning, from my friend Mr. Gibson, on breeding animals to type. It brought out this point, that we want proper ideals before us. This show here helps to create these ideals. You cannot succeed in anything unless you have some ideal, and unless you are working with some purpose before you. Then these shows give us inspiration. Even supposing a man does not come quite to the top, he is stimulated to try again.

I am delighted that you have been able to make such a good exhibit, and I hope that in the future you may do still better than you have done. It is far better to do a little well than to undertake a great deal and only half do it. I obtained a good illustration of this from a Boston paper the other day, giving an account that came from the State of Maine. We have heard, because it has come into the sphere of politics, of the waste land in the New England States. Here comes a statement from Caribou, in Maine, showing what a couple of farmers were able to do there because they had "top dressed their land with brains." These men were growing what they could sell and produce to the best advantage, and that was simply potatoes. One of them, on 23 acres, produced 1,660 barrels of potatoes at $2.25 a barrel, returning him $3,320, and 570 bushels of small potatoes which he sold to the starch factory at 15 cents per bushel, making $85.50 ;

total $3,505.50, or $148 per acre. The other on 25 acres produced 1,969 barrels, valued at $4,430, and 1,975 bushels of starch potatoes, valued at $176.25; total $4,606.25, or $184 per acre. The fact was pointed out that men had been leaving that particular land to go to the far west and were not doing half so well as the men who remained at home and used their brains in their work. What I would impress upon the advanced farmers gathered here is, whatever we do, let us undertake to do it well.

I want to congratulate the gentlemen here—our breeders and progressive farmers—on the success they have attained, the success achieved at Chicago, and the success that is with you still as exhibitors at this show. I know these are times that try us very much, but the only road to success is along the lines I have suggested. I hope that in the near future we may see brighter days than we have had during the past year or two. I have faith enough to believe that the depression will not continue, and that it will not be long before the agriculturist is on top. He is the man who by hard toil is producing the wealth of the country and ought to be on top, and I do not know how any one can begrudge him that position. (Loud applause.)

VICTORIA RINK, Dec. 7, 11 a.m.

Council meeting resumed. In addition to yesterday's members, Mr. D. M. Macpherson, of Lancaster, was present.

The Council granted the use of the room lately occupied by Mr. C. C. James to the Secretary for the use of the clerks of this Association.

D. MCCRAE, of Guelph, by request of the Council, addressed them on the subject of "Holding Sheep Sales during the Month of September." He thought the Council might offer prizes or inducements to bring out these animals at the time when parties could buy without looking all over the country.

EVENING SESSION.

WELLINGTON HOTEL.

The same members were present with exception of President Rowand and J. C. Snell. Mr. Dawson, Vice President, occupied the chair. On resolution it was resolved that at the next meeting of the Council they take into consideration the establishment of Stock Sales, and that the Finance Committee be instructed to put in the estimates the sum of $1,000 for this purpose, with the view of establishing one in the east and one in the west of this province.

Resolved, That the President and Mr. Edwards be appointed as a delegation to wait upon the Ministers of Agriculture for the Dominion of Canada and Province of Ontario along with delegations from other live stock associations to press on them the necessity of negotiating with the Minister of Agriculture of the United States to allow our Canadian herd books to be accepted as authority by the Custom House Officers in passing live stock free across the lines as was formerly the case.

AGRICULTURE AND ARTS ASSOCIATION.

GUELPH, December 8.

An adjourned meeting of the Agriculture and Arts Association was held here yesterday.

A meeting of the Finance Committee was held to look into the financial standing of the institution, at which the Treasurer and Secretary explained the different works carried on by the Association and the manner of keeping the accounts. Suggestions for improvement, especially in the matter of the item "sundries," were made.

After the interview the following resolution was passed at the evening session of the council :

Moved by Mr. James Haggarty, seconded by Mr. J. Sissons, that after having heard the explanations of Mr. H. Wade, our Secretary, respecting the receipts and disbursements of our Association, we feel that the thanks of this Board are due to him for the interest he has taken in the advancement of our Association, both financially and otherwise.

The report of the Finance Committee was then presented and adopted. It showed the following estimate required from the Government over and above the ordinary income of the Association : Spring Horse Show, $1,000 ; Fat Stock Show, $1,500 ; plowing matches, $600 ; expenses of Board, $500 ; printing herd books, ordinary, $1,000 ; live stock sales, $1,000 ; total, $5,600.

The Secretary was authorized to ask for tenders for printing the second volume of the Ayrshire Herd Book and the eighth volume of the Clydesdale Stud Book.

FIRST ANNUAL MEETING OF THE CANADIAN HACKNEY HORSE SOCIETY.

The first annual meeting of the Society was held at the Rossin House, Toronto, on the 8th day of February, 1893, at 8 o'clock, p.m.

The President, Mr. John Hope, opened the meeting, occupying the chair.

Among the members present were : Robert Davies Toronto ; Dr. Andrew Smith, Veterinary College, Toronto ; W. D. Grand, Toronto ; Robert Bond, Toronto ; Graham Bros., Claremont ; Geo. Hastings, Deer Park ; Robert Miller, Brougham ; W. D. Sorby, Guelph ; A. J. C. Shaw, Thamesville ; John Holderness, Albion Hotel, Toronto ; G. W. Green, Toronto ; Geo. Pepper, Markham ; R. Beith, Bowmanville ; Secretary Wade.

The Secretary read minutes of the last meeting of the Society on 8th February, 1892. On motion the report was adopted.

The executive and financial report was then read by the Secretary.

Secretary-Treasurer's Report.

Toronto, February 8th, 1893.

To the President and Directors of the Hackney Horse Society :

Gentlemen.—Our introductory meeting was held on the 2nd of February last, at the Queen's Hotel, and a resolution was passed forming a Canadian Hackney Horse Society under the auspices of the Agriculture and Arts Association. The membership fee was fixed at $5 per annum, and officers were elected for 1892, as read in minutes of annual meeting. A motion was carried calling a meeting of the Directors for the 9th of March, at the Rossin House, to adopt a constitution and by-laws, and a committee consisting of Messrs. Grand, Hastings, Grenside, Wilson and the Secretary were appointed to prepare said constitution.

This meeting was well attended, and it was decided to adopt the American constitution, as far as the standard was concerned, with a more moderate scale of fees. Inspectors were also appointed from various provinces to pass mares considered to have breeding and action sufficient to admit of half registration.

Inspectors for Ontario : John Carson, Kingston ; D. H. Grand, London ; Dr. Grenside, Guelph ; Dr. McLean, Meaford ; W. D. Grand, Toronto.

Inspectors for Quebec : Robert Ness, Howick, Q. ; James H. Cochrane, Hillhurst, Q. ; Prof. McEachran, Montreal, Q.

Inspector for Manitoba : T. G. Ferris, Portage la Prairie.

Inspector for Nova Scotia : A. S. Slip, Truro.

Membership.

Twenty-three gentlemen have joined the Association during the year, paying $5 each as fees—not a bad showing for the first year.

Registrations.

Twenty-four animals have been recorded during the year—13 stallions and 11 mares—not a bad record for the first year. One of the mares was admitted by inspection and her colt was half registered; surely there are more in the country to come forward. All the rest were either imported or from imported stock.

Exhibition Animals.

A great many of these animals were exhibited at the principal shows both in Canada and the United States. The celebrated "Firefly" and others owned by the Graham Bros., of Claremont, won a great many honors, and the stud of R. Beith & Co., of Bowmanville, proved to be winners at both Detroit and Toronto.

I also beg leave to report, as Treasurer, the following:

Financial Statement for 1892.

Receipts.		*Expenditure.*	
1892.		1892.	
Dec. 31-st.—To 23 members at $5	$115 00	Sept. 16th.—By cash two special prizes Toronto Industrial Exhibition	$60 00
		Cash on hand	55 00
	$115 00		$115 00

All of which is respectfully submitted.

H. Wade,
Secretary-Treasurer.

And on motion of Mr. R. Davies, seconded by Mr. R. Miller, the Report was adopted.

The President: I regret very much we have not better attendance here. It seems to me with the interest and the value of the Hackney horse to this country at the present time that we should have had a very much larger attendance. However, evidently we have no drones in the hive of those that are present, and with the very intelligent audience that is here I am quite sure that the Association will be carried to a success. We will now proceed to the election of officers.

Election of Officers.

The election of officers was then proceeded with and resulted as follows:

President, John Hope, Bow Park, Brantford.
Vice-President for Ontario, R. Davies, Toronto.
" *for Quebec*, James A. Cochrane, Quebec.
" *for Nova Scotia*, James B. McKay, Stellarton, N.S.
" *for New Brunswick*, Hon. D. McClelland, St. Johns, N.B.
" *for Prince Edward Island*, C. C. Gardiner, Charlottetown, P.E.I.
" *for Manitoba*, J. S. Rutherford, V.S., Brandon, Man.
" *for North West Territories*, W. Bell Irvine, Cochrane, Alta.
" *for British Columbia*, S. F. Tolmie, V.S., Victoria, B.C.
Auditors: George Pepper, G. W. Hastings.

Directors: Robert Bond, John Holderness, R. Graham, R. Miller, F. Grenside, V.S. R. Beith, W. D. Sorby, G. Hastings, W. D. Grand.

Delegate to Toronto Industrial Exhibition: John Hope.

Delegate to Montreal Exhibition: James A. Cochrane.

Delegate to Farmers' Institute: R. Miller.

The PRESIDENT: I thank you very much, gentlemen, for the kind way in which you have placed me here. I assure you I shall endeavor to do all that is in my power to carry it on successfully. I have not been able to give it the attention this year I expected to have done, and I shall double my efforts for the coming year.

Mr. DAVIES: I think as we have a representative here from the Dominion Horse Sale Association we would like to have his views. It would be very beneficial to a great number of us. It is to establish a horse register or something of that kind, whereby anybody in Toronto in scouring the country will have an opportunity of looking the register over and find in any part of the country who has any horse to sell.

The representative for the Dominion Horse Sale Association spoke as follows: I come here recognizing the fact this is a matter that is of importance to all and it may not be out of place and be of interest to you to explain as I have been requested to do the nature of the institution I have come to represent. It is in regard to a horse directory. It was felt necessary that such an institution should be in operation in this country, and a delegation of horsemen waited on the Dominion Government this last session and placed the matter before them, and action was taken. By means of this directory purchasers of horses are able to have located for them without any trouble whatever, compared with what they might have without this, any particular horse or class of horse they desire to purchase, thus avoiding loss of time. The Dominion Government of course are anxious to furnish to the world information in regard to the horse breeders of this country and assist them and they will publish it as parliamentary matter. It is quite similar in nature to a directory in a city, to tell people where to go to find any particular person. The Dominion Government proposes to publish these lists to intending purchasers and assist along this line in whatever there is to do.

Mr. DAVIES: What is going to be the fee for registration?

REPRESENTATIVE: Twenty-five cents when it is sent to the directory. There is no charge to the enquirer.

Mr. DAVIES: Does the embargo placed upon Clydesdales interfere with the Hackneys on the other side?

The PRESIDENT: Not at all; because of our registration nothing can get in because our rule is exactly the same as the Americans'.

Mr. PEPPER: I do not think you understand that question: It is the question of having five crosses on the sire's side and four on the dam's side, refers to all horses.

The PRESIDENT: We are governed altogether by the rules of the American Association, so there is no possibility or probability of their interfering with anything we would ship across.

The SECRETARY: The way I understand it is that horses that are entered in the American book will be passed across the lines free, no matter whether it is in our book or not, and even if it is in our book or the English book, if it has not four crosses on the dam's side and five on the sire's side they make it pay duty. But the registration is another thing to the passing over the lines, and you very rarely see a Hackney with five crosses.

Mr. MILLER: Mr. Davies was deputed by the Clydesdale Association to wait upon the American Clydesdale Association to intercede for this country to get our Clydesdales through free. I think it would be a very good idea for this association to authorize him to intercede with them for the Hackney Horse Association.

MEETING OF DIRECTORS

It was moved, seconded and carried that Dr. O'Neill, V.S., be appointed one of the Inspectors in place of D H. Grand. On motion of Mr. HASTINGS, seconded by Mr. MILLER, Mr. Thomas Irvings of Winchester, was also appointed an Inspector for Ontario. And Mr. Robert Bond was also elected on Inspector.

Moved by Mr. DAVIES, seconded by Mr. MILLER, that the $30 for the Spring Horse Show Sweepstakes for the Hackney stallion of any age be confirmed. Carried.

Moved by Mr. DAVIES, seconded by Mr. HASTINGS, that the sum of $60 be set aside for the Industrial Exhibition, to be supplemented by the Association by as much more as possible for the purpose of forming a special class of the Hackney breed of horses at Toronto. Carried.

Moved by Mr. MILLER, seconded by Mr. JOHN HOLDERNESS, that the committees arranging for next annual spring Stallion Show make a full list for classes of Hackney horses, the same as for other breeds of horses. Carried.

At 10 o'clock p.m. the meeting adjourned.

CLYDESDALE HORSE ASSOCIATION OF CANADA.

The seventh annual meeting of the Association was held at the Albion hotel on the 8th day of February, 1893, at 2 p.m.

Mr. WILLIAM SMITH, M.P., president of the Association, took the chair and opened the meeting.

There was a large attendance of members, including James Beith, Bowmanville; Geo. Clayton, Peepabun; J. W. Rogers, Toronto; O. Sorby, Guelph; Jas. I. Davidson, Balsam; Robt. Miller, Brougham; Jos. Watson, Greenbank; John Duff, Rockwood; A. E. Major, Whitevale; Robt. Watson, Jr., Varney; F. J. Crone, Toronto; Robert Graham, Claremont; Alex. Doherty, Ellesmere; Neil Smith, Brampton; John Thompson, Pine Grove; Mr. Green, Toronto; John Davidson, Ashdown; Jas. Hunter, Alma; Wm Johnson, Woodham; Robt Heron, Ashburn; Peter Heron, Scarboro' Junction; A. Cameron, Ashburn; Peter Christie, Manchester; A. Johnston, Greenwood; George Pepper, Markham; Jas. Allan, Marshall; Robt. Davies, Toronto; D. McCrae, Guelph; Geo. Gray, Clark; Geo. Kerr, Yelverton; Jas. Lousk, Taunton; Jas. Leask, Greenbank; Wm. Innis, Bradford; T. Graham, Claremont; Jas. Oberry, Toronto; T. M. Whiteside, Innerkip; W. D Sorby, Guelph; Phillip Brooks, Whalen; John Hope, Brantford; Henry Wade, Secretary, Toronto.

THE PRESIDENT: Before we commence our meeting I want to say I am very much pleased to see so many of you present. It shows, notwithstanding the distress, that though the Clydesdale business has suffered during the past year there is still a considerable interest taken in that class of horse, and I am very much pleased indeed to see you are showing that interest by your presence to day. It is not the time to pull off when we are in trouble, but it is then we want you to stand by the Association, and you are standing by the Clydesdale Horse Association to-day. I have much pleasure in calling upon the Secretary to read the minutes of the last annual meeting.

SECRETARY'S REPORT

I beg leave to present to you the Seventh Annual Report of this Association, showing the business done during the last year.

Registrations.

We have recorded for the 7th Volume 213 horses and 232 mares, or a total of 445, of which 61 stallions and 29 mares have been imported from Britain, leaving 355 bred in Canada. We have still fallen off somewhat in registrations, owing to the dulness of trade in horses, still with the Scotch appendix of sires and dams not before recorded with us we will have enough for a fair sized volume.

From our list of transfer we find that 36 stallions and 31 mares have been exported to the United States, and 19 stallions and 13 mares to our own North-West. Of course this official list does not cover all that have been exported, but only the ones transferred on our books.

During the last year two objectionable orders were issued by the Treasury Department of the United States in regard to passing pure bred animals for breeding purposes across the lines. The first one required four crosses on both sides of sire and dam, but as a great many of our Canadian cattle and horses could pass under this rule, and as our Stud and Herd Books were acknowledged, and animals allowed to pass over by showing our certificates, if the schedule of crosses could be filled up, we were in a matter content, as the hardship fell on the dealers of imported animals, and on Great Britain. The parties most interested soon made such a clamor that the Treasury Department on the 2nd of May issued a modification of the old order, allowing animals to pass with four registered crosses on the dam side and one on the sire side, but coolly left out purposely all our Canadian Records, and, quoting from a letter received by your Secretary from the Secretary of Agriculture of the United States, "Not because the standard of our books was not high enough, but because of the almost unanimous request of the Live Stock Associations of the United States." You are all aware that this regulation is an injury to our Records, which you know in the case of the Dominion Short Horn Breeders' Association the standard is higher than that of the American one, and in our case quite as high. The letter went on to say that it was not a hardship for parties who buy horses and cattle in this country, as the American Records were so near that there need not be any delay in getting them recorded, which does not quite agree with the facts, as it usually takes some time to record an animal over there. As a strengthening to their books it was not necessary, as surely all animals taken over there would in the course of time be recorded there without this compulsory Act. It was not a neighborly act, to say the least of it. Mr. Buchanan, of the Live Stock Department, takes a broader view of this subject, and our certificates are quite enough to enable horses to exhibit at the World's Fair.

A goodly number of Clydesdales have been inspected for the World's Columbian Exposition, and it is to be hoped that the exhibitors will keep them in the best possible condition for this great advertising medium, and that Canada will come back from there with new laurels added to her brow.

Spring Stallion Show.

This was again held in association with the Spring Show of the Agricultural and Arts Association, and was very successful. Two hundred dollars and a gold medal were contributed by the Agricultural and Arts Association ; a gold medal from the Toronto Industrial ; $177 was collected from the hotels and merchants of the city, the balance coming from our own funds. The cash premiums paid out amounted to $495. We also presented a marble clock valued at $40 to the Hochelaga and Montreal Spring Horse Show, $25 in cash to the Winnipeg Industrial, $25 to the Toronto Industrial, $25 to the Western Fair, London, and $25 to the Montreal Industrial Exhibition, thus spreading the benefits derived from the Clydesdale Association all over the Dominion of Canada

There were 21 entries in the aged class of grand bulky horses—hardly a cull in the lot. In the 3-year old class there were 11 entries of good, capable horses, and 4 entries for stallions under 3 years of age.

In the purely Canadian bred class we had the best show ever held before in Toronto ; no less than 7 entries in the aged class, 5 entries in the 3-year old class, and 10 entries in the colts under three years of age class.

The sweepstake prize for Clyesdales this year was won by the Graham Bros., with "Queen's Own" (imp.) [1705] (7176), and the sweepstakes for the Canadian bred was won by Peter Kelly, jr., of Brechin, with "Pride of Dollar" [962]. The show this year is again to be held in partnership with the Agriculture and Arts Association, on the 8th and 9th of March next, and has every hope of being as successful as it predecessors.

We have once more had the unpleasant duty of investigating a false pedigree sent in by J. E. Hinkson, of Oshawa. He pleaded guilty, and was summarily fined $25 for so doing.

The PRESIDENT: You have heard the minutes, what shall be done with them?

Moved by Mr. McCRAE, seconded by Mr. GEO. DAVIDSON, that the minutes be confirmed. Carried.

The Secretary then read his Annual Report for 1892, also the Treasurer's Report.

TREASURER'S REPORT.

I have the honor, also, as Treasurer of presenting to you the annual statement of the finances of the Association, verified by the Auditors.

Receipts.		*Expenditure.*	
1892.		1892.	
January 1st—To cash on hand	$106 68	Feb'y 2nd—By H. Wade, salary	$50 00
March 1st—To grant from Agriculture and Arts Association	200 00	March 25th—By Spring Stallion Show Premiums	495 00
March 26th—To subscriptions Spring Show	177 00	March 26th—By expenses collecting subscriptions and amount not paid, 1891	16 00
Dec. 31st—To 200 yearly members	690 00	March 31st—By A. G. Campbell, reporting	5 00
		March 31st—By John Wanless, stock for Montreal prize	40 00
		June 30th—By one-half expense cut Grey Clyde for Vol. 6	25 00
		July 1st—By Special prize Winnipeg Industrial Exhibition	25 00
		Sept. 16th—By Special prize Toronto Industrial	25 00
		Sept. 19th—By special prize Western Fair, London	25 00
		Dec. 31st—By 197 Stud Books to members	270 55
		Dec. 31st—By cash on hand	82 13
	$1,083 68		$1,083 68

February 8th, 1893. Audited and found correct.

The PRESIDENT: You have heard the Secretary-Treasurer's Report read. It is now open for discussion if there is anything requires it. Might I be permitted to draw your attention to one of the clauses here. You will remember during the past year a couple of very objectionable orders have been issued by the Treasury Department of the United States in regard to the passing of our animals from this side to the other. Perhaps at the first glance you will scarcely recognize the importance of these orders. You may have found out practically the results, some of you, and other may not, but there can be no question that the orders have had a very great effect upon the sales of Clydesdale horses; that is, those that can be registered in the Ontario Book, to dealers upon the other side. The order has had a very bad effect indeed, I think, upon our own record. If we wish to send a pure bred animal, one that was previously recorded in our own book, to the other side, they must be recorded in the American Book. That will have the effect of destroying the Canadian Book. It simply can be kept in the future as a record, if it is continued. I would be very sorry indeed as a Canadian to see that book destroyed. I would like to see it kept, if for nothing else, for a record, for I think in the course of a short time, at the very longest, something will be done to make a great change in this direction. One clause of this report says, "at all events it was not a very neighborly act." Well, perhaps, looking at it from my standpoint, at all events, I can see nothing in it but a very unneighborly act, and that has been the conduct of the authorities of the United States during the past twelve or eighteen months. Why they should do it, this is not the place to discuss. I do not propose to do

it anyway, but every step they have been taking during these months has been in the direction of injuring some of the great interests of the farmers of Canada. I do not think that the report is at all too strong, in fact perhaps if I had had the drawing up of it it would have been much stronger than it is, but I think we in Canada, with our active, intelligent people, with our great resources, should not let it go by saying it is an unneighborly act upon the part of the United States.

The financial part of it is one you should be interested in. It leaves a small balance in hand, comparing favorably with last year, and you will notice, too, that we have not been very niggardly in the money that has been at our disposal. We have contributed to the Hochelaga, Montreal Horse Show, $40; $25 to the Winnipeg Industrial, $25 to the Toronto Industrial, $25 to the Western, $25 to the Montreal. The report shows the benefits derived from Clydesdales all over the Dominion. That is one of the objects in forming the Association. The amount of money in our hands has not been large, and I think we have distributed it fairly amongst the places, trying if possible to make them take an interest in our work and record, as well as showing we in the central part of the Dominion were not forgetting them.

Mr. McCRAE, of Guelph: I would move the adoption of this report. I agree to some extent with what the president says in this matter—perhaps not altogether. If I were disposed perhaps I might give a reason, but I do not think this is the time or place to do so. I certainly think that the orders which are alluded to in this report are exceedingly objectionable, as far as we Clydesdale breeders are concerned. The first order was one that required five crosses upon the side of the sire and four on the side of the mare and that all these crosses should be carried by name and number right out to the legitimate end of these crosses in both cases. I do not suppose there is a single Clyde horse in Canada would fill the requirements. I believe this order was largely put on by the Clydesdale Association of the United States. They felt aggrieved, and I will not say they had not some cause for it. I have spoken to some of these gentlemen about it and they said, "Well, your secretary, Mr. Wade, signed your pedigrees which were not really pedigrees," alluding to the Draft Horse Association, and they said, "Unless you change your secretary we cannot tell but what some more of these pedigrees will be in the same shape." That is where they tried to put the blame. At the same time they said, "We do not feel so hardly at you as we do feel at a book called the Goderich Book, that is practically nothing but a fraud got up," that is their statement, to deceive poor, innocent Americans, (laughter), and which gave pedigrees to horses which really were never entitled and could not be entitled to any pedigree. This is a different matter. I suppose some of you gentlemen could answer that question and say there was nothing in it. I do not know that any of us could give a straight answer, and say there was not something objectionable in that Goderich Book. But I want to say that I scarcely feel like the president, that we should let this matter rest as it is. That order was changed and a fresh order has been issued by which animals may be entered if they have five crosses, but you do not require anything but the male animals registered. None of what we call our Canadian bred animals, who are entered in our Canadian Book, are eligible for that. I think Mr. Miller is a member of the executive on the other side. I think we ought to endeavor to get Mr. Miller to go before the executive and put the facts before them, and have the Clydesdale Association work, if they agree to work, with us. We are working for one object, and that is, the Clydesdale Horse in America. Any Canadian ought to be, and I think Mr. Miller is, interested in bringing prominently before the men in this continent the values and merits of the Clydesdale horse, but it is hardly fair for those in America to take the stand they have, and I think Mr. Miller ought to represent that. There are one or two Canadians on that Board. I believe; I do not see why he might canvass that Board very well and get from it a request to the Treasury Department that our books be recognized. I think if Mr. Miller shows himself as energetic in that as in many other phases he will be able to carry that. I think we ought to ask him, in the position in which he holds in the United States Executive, to request that the Executive send a letter to the Secretary of the Department and ask that our Book be recognized. What do you think, Mr. Miller, about that?

Mr. MILLER: I took it upon myself before I was a member of the Executive Committee of the American Clydesdale Association to ask that our Book be recognized by the Association over there. They gave me the same reasons they have evidently given Mr. McCrae for not recognizing the certificates issued by this Association. We went into the matter at their request, and made an investigation concerning two or three certificates they said were erroneously issued, and we traced them to the bottom and found they were fraudulently issued, and we punished two people for it. I went to them again, and said that "We have punished the men that have forged pedigrees and have them recorded in our books. Now, we would like you to recognize our book, and we would like you to use your influence to have our book and our certificates recognized by the authorities at Washington." I canvassed them personally and individually. They promised me that they would give me all the assistance they could in this direction, but after I left them I could not attend the meeting of the Executive and have a vote there. After I had this promise, Mr. Mills, the Secretary of that Association, used his influence in the opposite direction. Mr. Mills in my opinion has never been friendly to the Clydesdale cause in this country, I am not a believer in him at all. I think he has been the greatest drawback the Clydesdale horse had to come in contact with in America. That is the opinion not only of Canadian breeders but I believe it is the opinion of the majority of the breeders in the United States. However that may be, it seems that he has the ear of the Executive Committee and of the officers of the American Clydesdale Association to such an extent that he can persuade them that his opinions are correct, so I could not have the influence I hoped at one time to have. But I am like Mr. McCrae in this matter, I do not intend to give it up yet. I mentioned this when I was asked to be a member of that Executive Committee. I mentioned to them it was no use for me to go there if I could not have some say for the people I was supposed to be there to represent, and I felt in that way. If I cannot go there to say "I am representing Canadian breeders, and I wish you to think their interests your interests," I do not want to go at all. That is the position I hold.

Mr. McCRAE: I am very glad of Mr. Miller's explanation, and I think we are all better of it, but I think we ought not to let this matter rest now. I think we ought to do something to get this most objectionable order rescinded. I am satisfied if our Clydesdale brethren on the other side will memorialize the Secretary of the Department at Washington, especially after the 4th of March, that this matter may be put in better shape than now. If it is necessary to make a motion to that effect I will be very glad to do so, but I think our Association at this time should look into this matter and work hard and earnestly for this object. I think it can be carried out if we work energetically towards it, at least I think it is worth the trying. I think if we do not get that we should not look upon our book as only a record. We are here to breed Clydesdale horses in Canada. We will have some Clydesdale horses if we never send another horse to the United States. At the same time we must recognize the fact that the best part of our trade is the trade with the United States, and we want to continue it, if we can, on fair terms, but I do not feel we are going to knuckle down to the Americans. We are willing to give them what is fair and straight and right; we want no crookedness as far as this Clydesdale Association is concerned. We are willing to make them a fair offer in every respect. I move the adoption of the Report.

Mr. MILLER: I have much pleasure in seconding that motion.

Mr. JOHNSTON, of Greenwood: I wish to say this—I have heard it reported that now the Americans are likely to stop trade in this matter. I hope we do not live at the mercy or good will of the Americans, but we do not come here to scold and jaw them and call them hard names if they do not please to deal on such terms as we would like. Mr. McCrae says this Association was formed more particularly for the preservation and safeguard of the American and Canadian Clydesdale interests. One would suppose, by very much you hear among horsemen, that this Association was formed for no other purpose than to fit horses to pass over the lines. Now, it is a good thing if it does so fit and qualify them to pass over the lines, but we would deserve very little credit in the matter if we only formed the Association for that. We are five millions of people and will be ten million in a short time, and whether we are doomed to be an in-

dependent people or whether we remain as we are it does not make a bit of difference to us ; but let us preserve our Clydesdale interests as carefully and as earnestly in the one case as in the other. We will find it will not only be satisfactory to have good horses but it pays in the end. I think it is an exceedingly foolish thing to throw up the sponge and say we cannot get on because our next door neighbor does not trade with us on exactly the same terms we wish they would. It is not dignified nor self-respecting, and I think if our newspapers wrote a great deal less, and we maintained a far more dignified and self-sufficient attitude towards the United States, it is very likely they would treat us with very much more respect and consideration than they do now. The motion carried.

Election of Officers.

The election of officers was then proceeded with, and resulted as follows :

President : Robt. Davies, Toronto.

Vice-President for Ontario : Mr. Arthur Johnston, Greenwood, Ont.
" *Quebec* : Robt. Ness, Howick, Que.
" *Nova Scotia* : Wm. O'Brien, Windsor. N.S.
" *New Brunswick* : A. S. Murray, Fredericton, N.B.
" *Prince Edward Island*: Hon. James Clow, Murray Harbour, P.E.I.
" *Manitoba* : J. E. Smith, Brandon, Man.
" *North-West Territories* : John A. Turner, Calgary, N.W.T.
" *British Columbia* : H. D. Benson, Ladner's Landing, B.C.

Auditors : G. W. Green and A. E. Major.

Directors : Robert Beith, M P., Bowmanville ; W. D. Sorby, Guelph ; John Davidson, Ashburn ; George Cockburn, Baltimore ; Alex. Russell, Carrville ; Robt. Graham, Claremont ; Robt. Miller, Brougham.

Delegate to Farmers' Institute : D. McCrae, Guelph.

Delegates to Toronto Industrial Exhibition : John Davidson, Ashburn, and Henry Wade, Toronto.

Delegate to Western Fair : E. W. Charlton.

Delegate to Ottawa Fair : R. Good.

Delegate to Montreal Exhibition : Robt. Ness.

Mr. Davies : I must thank you, gentlemen, for the honor you have conferred upon me as a member of the Clydesdale Association. You have heard a good many remarks this afternoon as to what should be done and how to put ourselves in a better position than we are to-day. There is no doubt we are suffering a good deal, and from the expressions of Mr. McCrae and others it will be the business and the honor of this Committee for the next year to see and guard the interests as well as possible, to foster the industry of the Clydesdale Association. With regard to our Clydesdale Book I think it would be a great mistake on our part if we ever allowed that to die. I know that if we have in any business matters rebuffs of one kind and another it will not do to let go our hold ; keep up, stick to our cause ; it is a good and honest one. Sometimes we have black sheep in our fold. Stick to the cause and after a while our American friends may feel that they have made a mistake, and we will not have any trouble in hunting up our records as we will have everything to our hand. Thanking you for the honor you have conferred upon me, I will do everything I can possibly do to assist the Association. (Applause.) The chair was then occupied by Mr. Davies.

Mr. McCrae : I have been thinking over this matter of the American Book and the American regulations, and I think it would be well if this Association would appoint a small delegation who would be specially asked to take into their consideration the best way to get the objectionable order rescinded and have this Book recognized as one of the pure-bred Clydesdale Records of the world ; and as a consequence of that that animals recorded in this book, and whose pedigrees would be properly authenticated by our secretary, should be admitted into the United States the same as they would be if recorded in

the Clydesdale Association of Great Britain and Ireland. I think it would be well if you yourself, Mr. President, would be appointed as leader of the deputation, and some other gentleman be appointed also to see not only the Clydesdale Association, but any of the officials on the American side who would have influence in having this repealed. I suppose after the 4th of March it would come before the Minister of Agriculture of the United States, and I think it would be well if this deputation were authorized to take such steps as they deemed advisable to interview the authorities of the United States towards this object. I think this is one of the most important things that has come before us for some time. We are quite assured that we can bring up Clydesdale horses here and keep up our record without the Americans, but if it is possible to get a fair measure of reciprocity in getting horses across the border we want to have it; and I think if a little money was spent by the Association in this way would be well spent money in endeavoring to get the boon we are asking for. Would any gentleman suggest any names?

Mr. JOHNSTON: I would suggest Robert Miller and Mr. McCrae.

Mr. DAVIDSON: I would move that the President, Mr. McCrae, Mr. Miller and Mr. Davies be appointed. Seconded by Mr. Johnston.

Mr. MILLER: As one of the committee I would like any suggestions any one of the meeting could give us to go to work to get the recognition from the Association over there or from the Government that we are supposed to ask. I would like the members of the Association to make it clear to us what their intention is. Whether we should go to the American Clydesdale Association and ask them to go to work and use any influence they might have brought to bear against us, to remove that influence and say that we have made changes in our Book so that we thought it would be no harm for the Administration to give our Book recognition, or whether they approve we shall go to headquarters, go to the Minister of Agriculture there, or the Secretary of Agriculture, and ask him to look into the matter.

Mr. MCCRAE: The intention is this committee should take such steps as they deem best. Matters may arise that we cannot foresee now. What we want is to get the embargo removed from the Clydesdale horses. It is not a matter of a few dollars; it is a matter of very great importance to the Clydesdale Association. We want them to be all enthusiastic, but we want them to keep the bond if they go into it. I am willing to step aside out of the committee if anyone wishes to go on the deputation. Perhaps Mr. Graham would take the place. My name has been mentioned without my special wish.

Mr. JOHNSTON: I think the deputation named is good enough. The only thing is where it should go.

The committee appointed consisted of Mr. Dryden, Minister of Agriculture, Messrs. McCrae, Miller and Davies.

Mr. MCCRAE: We are representing this Association; we are not going on our own hook—we are representing the Cydesdale horse Book.

The PRESIDENT: It has been decided that the committee appointed should wait upon the American authorities and make the best arrangements they can.

Mr. MCCRAE: There is one other matter I would bring up before this meeting. There is a matter coming before the Central Farmers' Institute of this country which is now in session in this city to this effect, would it be in the interests of the Stock Raisers of this country to license owners of all male animals travelling through the country for service.

The PRESIDENT: I think this is one of the most important questions we have ever had before the Association. It is something that was talked of in the Australian Association years ago. Everybody seemed to be a little chary about it, but I do not think we can have a more opportune time than the present.

Mr. JOHNSTON: If it is a question of sentiment only I think a great deal can be said in favor of the step you propose. But if it is to be a matter of quality I think it is an

exceedingly dangerous step, and I certainly would be opposed to that. The only license that can be instituted with any degree of safety or liberty I might almost say is the one of a pedigree. Anything else beyond that I think is quite out of the question.

Mr. McCRAE: Do not you think a rule should be made that every pedigreed animal should be licensed?

Mr. JOHNSTON: The very argument that established the fact that poor people in Canada had suffered a loss on account of scheduling cattle—lean cattle, will be quite opposed to your position that only licensed animals be allowed to travel, for a poor farmer is not more able to pay for a thoroughbred bull or stallion than he is to fatten a lean animal. I move that our delegate to the Central Farmers' Institute be instructed to oppose that proposition in that Institution as inconsistent with the liberties of British subjects.

The PRESIDENT: I know it would be a great thing for the farmers to have better goods to offer our people, both the Americans and our English friends also, and think the matter well over before taking any step. It only requires a little training and we will all be much better satisfied. I know from my own experience it paid me better to pay more for a good sire than to fool away my money and have nothing at the end of the time.

Mr. SMITH: There is perhaps a good deal more in this thing than appears on the surface. I do not want to put it exactly in the light Mr. Johnston has done, that it infringes with the liberties of the subject, but I do not see where in the world you are going to draw the line. If you say every animal that has a pedigree shall be allowed to have a license, there are a great many that have pedigrees that are no better than scrubs, and on the other hand a great many of our grade horses and cattle have done inestimable service to our farmers. Are you going to force our farmers—not many of them in as wealthy sections as in Central Ontario—to contribute to the licensing of these animals? In the first place I think it is impracticable, and in the next place I think it is unwise to do so at the present time.

Mr. JOHNSTON: I know cows, and not a few of them, in South Ontario, whose produce I would use a hundred times over in preference to a highly-bred animal in that country. In other words I know cows whose produce is likely to be better than many thoroughbreds I know highly-bred.

Mr. ROBT. WATSON, Jr.: I understand the question to be something that would be to encourage the using of better thoroughbred sires. This Association and all the associations must admit that advancement and improvement have been made only with thoroughbred sires as a rule. I do not agree with the ex-President. That may be an instance but not as a rule. But unnecessary evils require sometimes to be legislated against and I think a scrub sire is one of those unnecessary evils.

Mr. MILLER: I might just say this, that this is a very difficult matter for any Association to handle. There has been an endeavor made for the past perhaps five or six years by certain individuals who breed Shorthorns in the United States to have the line drawn some place in the matter of recording Shorthorns over there. There has been a great deal of controversy on that question. It has been discussed in almost all forms, but I have never yet in all writing and all my listening to these discussions heard a man propose any way that this matter could be handled and dealt with. So I think if an active association like the Shorthorn Association of the United States dare not handle this question, and can see no feasible way of legislating in their private capacity on this question, it must be much more difficult to ask an administration or a Government of any country to legislate on it. While we must admit, and we all claim that are here members of this Association, that pure-bred animals have a better influence on a country than grade animals, we must at the same time admit many of our best customers have to start with cross-bred animals in the first place, so that I think we should not strike at these gentlemen. They are men who have toiled hard to get their cattle above the common sort, we should not strike them a double blow, and hinder them from making the little bit of money they are prepared to make out of them. There is not the slightest doubt that the fairest jury they can be before is the jury of the general public. The public

will deal severely enough with these men. They are not making very much money, and we know as well at the same time that those who have poor horses are not only making no money but are losing a lot, and perhaps the best way they can be handled is to leave them alone and they will very soon become like all others that are falling back into the rear. They will become defunct, and will drop out without our trying to legislate.

Mr. McCrae: The discussion has hardly taken the phase I thought of. I thought if there was anything done in this direction it would not be in the way of compelling a man not to use such a sire as Mr. Miller speaks about, but that we should provide a way by which our Clyde horses could be registered, and that no fees could be collected on an animal that was travelled, if the animal was not registered and was not licensed. This would not prevent any man using any kind he liked, but it would not prevent a man from not paying his fees if the man would not pay it.

Mr. Johnston: I would say there is not a man to day who is conversant with the needs of Ontario, to saying nothing of the rest of the country, but must know that in spite of all that has been done, in spite of all the Shorthorns and other breeds of cattle that have been imported, there is not one good bull in existence where there are not ten wanted, and the only question is the people are not able to pay enough money for them to induce a greater number of them to be imported and bred. But what are you going to do to prohibit the use of these cross-bred cattle? It is a dangerous subject.

Mr. Davidson: I think all the protection a man can get is his own judgment. I do not think you can legislate to make people protect their own interests.

Moved by Mr. Arthur Johnston, of Greenwood, seconded by Mr. James Leask, of Taunton, that our delegate to the Central Farmers' Institute be instructed to oppose any motion set on foot by that Institute to limit by license or otherwise the number of male animals for service as being contrary to the best interests of struggling farmers and contrary to British liberties. Carried.

Mr. McCrae: There is one other thing. Are animals bred in Canada to be considered Canadian bred? I am glad that the Toronto Industrial has decided that an animal bred in Canada is a Canadian bred animal. I consider myself a Canadian, though I believe I was imported when I was very young. I think our young men who are born here are considered Canadians. I do not think that we should take a parallel from the human race, so that to be considered Canadians we should have to trace o r lineage back to a squaw. Nor do I think that a Clydesdale horse if bred in Canada should be compelled to trace his pedigree back to the woods before he could be considered Canadian bred. I think we ought to consider animals got and bred in Canada—that is, that their service has been in Canada, the mare has been served in Canada and the foal foaled in Canada—to be Canadian bred. I move that this Association consider that animals bred in Canada shall be considered as Canadian bred.

Mr. Miller: I think Mr. McCrae will find it necessary to make it a notice of motion, if he expects to move in that matter next year. I do not think it will be according to our By-laws to make that motion here without those by-laws and constitution have been changed within the last two years; and I do not think they have. The motion was seconded by Mr. Duff and carried.

Mr. Johnston: There is another subject I wish to call your attention to. It has been frequently spoken of and advocated by not a few that the sweepstake ribbon be tied by another judge or judges. I wish to put this thoroughly before the meeting. I move to that effect, that the sweepstakes prize and other prizes be judged by a separate judge or judges. Seconded by Mr. Davidson. The motion was lost after some discussion.

Mr. Miller: Might I ask whether we are left without a rule on this one matter of limiting the number of times an animal can be exhibited. I believe as it stands now any horse that is here on exhibition can come in and show a second time for sweepstakes if he has a prize or not. Are there rules not printed now we have to show at this exhibition th s spring?

The Secretary: We have no particular rule. We have been copying more from the old provincial rules. If you make your one entry you can bring your horse in for the sweepstakes if you wish.

Mr. MILLER: It would be right to recommend that be done a year from now.

Mr. McCRAE: I move this matter be left for the consideration of the new Executive. Seconded by Mr. Major. The motion was lost.

The SECRETARY: In our prize list in class 8 we have "Open for Canadian breed only." A Canadian bred horse is defined by Clydesdale Association as a horse that does not trace on the side of its dam to an imported mare. Pedigrees required. Does this new resolution passed to-day make any change in that?

Mr. McCRAE: No; I think not. Not till next year.

Mr. JOHNSTON: It was not intended it should take effect, of course, this year.

Mr. J. W. Rogers, Secretary of the Dominion Horse Association makes statement as to his Association which is shown in his pamphlets.

At 4:30 p.m. the meeting adjourned to meet in Toronto next year.

Minutes of meeting of Directors of the Clydesdale Horse Association, held at the Drill Shed at 11 a.m., Thursday, 9th of March, on the second day of Horse Show.

Present: Robt. Davies, President, in the chair; A. Johnston, Robert Miller, R. Cockburn, W. D. Sorby, John Davidson, R. Graham, and H. Wade, Secretary.

The Secretary explained that he wished instructions as to what special prizes were to be given this year.

After a brief discussion, R. MILLER moved, seconded by D. SORBY, that $100 be awarded in special prizes to the Toronto Industrial, Western Fair of London, Winnipeg Industrial and Hochelaga County Society, Montreal, Q., ($25 to each) the directors of each Association to place the amount, as they think fit, in their Clydesdale lists. All animals competing to be recorded in the Canadian Clydesdale Book.

It was resolved that a special meeting of the Clydesdale Association be held on the Industrial Exhibition grounds on Tuesday of the second week at an hour to be determined by the President and Secretary at a future date.

The meeting adjourned.

THE SEVENTH ANNUAL MEETING OF THE DOMINION SHORT-HORN BREEDERS' ASSOCIATION.

This meeting was held at Shaftesbury Hall, Toronto, commencing on the 9th of February, 1893.

The proceedings were opened at 11 o'clock, a.m., and on motion of Mr. SIMMONS, seconded by Mr. HOBSON, and carried, Mr. ARTHUR JOHNSTON was elected Chairman of the meeting in the absence of the President, Mr. Gibson and the Vice President.

The members present among others were: Arthur Johnston, Greenwood; John McNabb, Rockwood; T. C. McAvoy, Balsam; J. C. Hanley, Read; John Miller, Brougham; T. W. Scott, Highgate; D. Brown, Iona; P. Malone, Ethel; W. W. Ballantyne, Stratford; Jos. Redmond, Peterborough; W. J. Biggins, Clinton; John I. Hobson, Mosboro'; W. J. Patten, St. George; S. J. Pearson, Meadowvale; W. Linton, Aurora; C. M. Simmons, Ivan; T. E. Robson, Ilderton; Thomas Russell, Exeter; David Rae, Fergus; Edward Jeffs, Bond Head; W. G. Pettit, Freeman; F. Shore, White Oak; J. J. Beaumont, Alport; Jas. Gardhouse, Highfield; James Russell, Richmond Hill; J. McArthur, Gobles; Samuel Allin, Bowmanville; Jas. Snell, Clinton; Jas. Leask, Taunton; J. Wilson, Green River; Geo. Leslie, Acton; L. Burnett, Greenbank; F. Martindale, York; D. D. Dyer, Brooklin; C. G. Davis, Freeman; R. C. McCullough, Georgetown; John Hope, Bow Park, Brantford; Hon. Thos. Ballantyne, Stratford; George Hardy, Ashgrove; Mr. McFarlane, Woodstock; F. Birdsal, Birdsall; Secretary Henry Wade, Toronto.

The Secretary read minutes of last annual meeting, also Secretary-Treasurer's Report, and on motion of Capt. Thos. Robinson, seconded by Dr. Patten, and carried, the minutes and executive reports were adopted.

EXECUTIVE REPORT.

The Secretary then read the minutes of the Executive Committee meeting held this morning.

Seventh Annual Report of the Executive Committee.

Toronto, February 10th, 1893.

The Executive Committee beg to report the Seventh Annual Report of the affairs of this Association, as furnished by the Secretary for the year ending 31st December, 1892

Registrations.

In 1892 we were paid for 3,655 registrations, 3,467 certificates, and 492 changes of ownership. From those we have only rejected 14 registrations, 13 certificates, and 1 change of ownership, returning the fees, leaving 3,641, registrations, 3,454 certificates and 491 transfers; against, in 1891, 3,135 registrations, 2,873 certificates, and 376 transfers; and against, in 1890, 3,166 registrations, 2,889 certificates, and 348 transfers; showing a marked improvement over any other other year, since the inception of the Association.

Registration Fees.

Following up the increase in registrations as a matter of course there is a corresponding increase in registration fees; in 1890 we received $3,043 75, in 1891, $3,152 50; in 1892, $3,835.25; a difference in favor of 1892 over 1891 of $682 75, and over 1890 of $791 50. This a very satisfactory increase and shows that the Shorthorn industry is in a satisfactory state.

Herd Books.

Vol. I. There were sent out in 1887, 550 volumes; in 1888, 51 volumes; in 1889, 33 volumes; in 1890, 19 volumes; in 1891, 21 volumes; and in 1892, 27 volumes to members and others, leaving on hand 299 volumes.

Vol. II. There were sent out in 1888, 451 volumes; in 1889, 39 volumes; in 1890, 26 volumes; in 1891, 16 volumes; and in 1892, 20 volumes to members and others; leaving on hand 448 volumes.

Vol. III. There were sent out in 1888, 226 volumes; in 1889, 189 volumes; in 1890, 46 volumes; in 1891, 16 volumes; and in 1892, 19 volumes to members and others; leaving on hand 501 volumes.

Vol. IV. There were sent out in 1889, 302 volumes; in 1890, 105 volumes; in 1891, 29 volumes; and in 1892, 21 volumes to members and others, leaving on hand 543 volumes.

Vol. V. There were sent to members in 1889, 130 volumes; in 1891, 130 volumes, in 1892, 78 volumes; leaving on hand 678 volumes, a great many of the regular members have not ordered this extra volume costing only $2.

Vol. VI. There were sent out to members in 1891, 345 volumes; in 1892, 29 volumes; leaving on hand, 626 volumes.

Vol. VII. There were sent out to members for 1892, 318 volumes, leaving on hand 682 volumes.

Vol. VIII. will be completed in a short time, and will contain all the pedigrees recorded up to 1892, and as in Vol. VII. each pedigree can be traced in its entirety by referring to the pedigree of another animal in the same volume, making the volume complete in itself. In this volume the cows are printed under the name of each owner; this plan delays us from numbering the females at the time of recording. It will be sent to the regular subscribers for 1892.

Vol. IX. has been closed, containing all the pedigrees recorded in 1892, and will be printed this year and sent to paying members for 1893.

Pedigrees on Record

Volume 1 contains	3,304	Volume 7 contains	4,954
" 2 "	4,427	" 8 "	4,024
" 3 "	4,593	" 9 pedigrees on hand	4,000
" 4 "	4,957		
" 5 "	4,388		
" 6 "	5,904		40,551

As shown by the above table, we are now recording for the tenth volume, which will contain animals recorded in 1893.

Number of Members from Inception to Date.

	New.	Resigned & Lapsed.	Not Paid.	Paid.	Total Paid.
B.A. 1882	164	..	..	164	164
" 1883	73	..	..	164	237
" 1884	42	..	..	173	215
" 1885	39	..	..	187	220
Dom. S. H. B. Asso. 1886	215	37	8	195	410
" " " 1887	80	54	81	357	437
" " " 1888	46	79	69	388	434
" " " 1889	36	37	91	398	434
" " " 1890	29	33	74	405	434
" " " 1891	32	67	59	365	397
" " " 1892	60	22	47	398	458

This table shows that our paid up membership roll has increased 61 in the last year in total numbers There are still a large number (47) who are in arrears for 1892. Our income from members' fees for 1892 was $1,896.

Office Work.

This continues to be about the same, fully 3,112 letters and cards having been sent out, besides several thousand entry forms; a list of errors is made in each volume, which should be marked in red ink in the volume mentioned. We also hope breeders will furnish us with any catalogues of sales that may be made during the year.

Your committee would call particular attention to the new rule requiring all calves born after the 1st of January, 1889, to be recorded before they are eighteen months old. A double fee will be charged after that date. Attention is also called to the clause in the constitution which requires that "a member must pay up all his fees in arrears before he can resign."

At the meeting of the new Directors after the last annual meeting, a Finance Committee consisting of Arthur Johnston, Chairman; Dr. F. I. Patten, Secretary; and James Russell, were appointed to meet every three months and audit the accounts of this Association. At one of these meetings, on account of the expense to this Association, they concluded to employ an expert chartered accountant, Mr. Geo. A. Savage, of London, Ont., to audit the books for 1893. This was done in July, 1892, and in January, 1893, and his certified statement appears below.

A great many Shorthorns were inspected and passed, subject to final revision at the Fall Shows, to go to the World's Columbian Exhibition. It is to be hoped that they will be kept in a liberal manner, as it behooves every owner of a good Shorthorn to bring it to the front this year. The American Shorthorn Breeders' Association is to conduct a

milk test with Shorthorn cattle at the World's Fair, and this Association has sent out one of its circulars along with a recommendation of our own to the members of this Association asking their hearty co-operation in this cause.

We regret to have to complain of the unneighborly, to say the least of it, conduct of the Treasury Department of the United States, by the advice of the Live Stock Associations over there, in leaving our Herd Book out of the list of eligible ones to pass animals across the line free of duty, when we all know that the standard is higher than any book printed.

Since the last meeting we have received the XXXVII Vol. of the American Herd Book and the XXXVIII. Vol. of Coate's Herd Book as exchanges.

Extracts from By-Laws.

SECTION 1.—Persons desirous of becoming members shall so notify the Secretary, pay the entrance fee and agree, if elected, to conform to the rules of the Association, and not to withdraw without paying all fees due, and giving three months' notice of their intention of doing so.

SECTION 2.—Members shall pay an entrance fee of $5, and subsequently an annual subscription of $4, which annual subscription shall be due and payable on the first of January of each year.

NEW BY LAW.—That all calves dropped after January 1st, 1889, shall in future be registered within eighteen months of birth, and if not so registered, double fees shall be charged for their registration.

SECTION 15.—Fees.—Charge for registration will be :

To members	$0	50	for each animal.
To Non members	1	00	" "
Certificates in either case	0	25	" "
Change of ownership after being recorded	0	25	" "

Financial Statement.

Receipts.

1892		
Jan. 1.	Cash on hand	$ 160 93
Dec. 31.	398 Yearly Subscribers	1,596 00
"	60 New Subscribers	300 00
"	Registration Fees	3,835 25
"	Herd Books Sold	44 00
"	Grant Agriculture and Arts	1,000 00
		$6,936 18

Expenditure.

1892		
Dec. 31.	By Registration Fees Returned	$ 23 00
	Printing and Stationery	144 05
	Postage	420 25
	Committee expenses, F. Green, Sr., Gold Watch	160 00
	Syndries	34 00
	Bills Payable, Hunter & Rose	100 00
	Herd Book, Vol. 7	1,895 21
	Herd Book, Binding, 150 Vol. 1	79 25
	Salaries —	
	R. L. Denison	700 00
	A. S. Hunter	60 00
	H. J. L. Laws	600 00
	H. E. Hall	476 00
	H. Wade	180 00
	W. F. Stewart	60 00
	Cash	1,534 42
		$6,936 18

Assets and Liabilities.

1892			1892.	
Dec. 31.	To Cash in Bank.....	$1,334 42	Dec. 31. By Balance.....	$7,069 92
	Office Furniture, Books, etc	100 00		
	Vol. I. D.H.B., 299 copies	448 50		
	" II. " 448 "	672 00		
	" III. " 501 "	751 50		
	" IV. " 543 "	814 50		
	" V. " 658 "	987 00		
	" VI. " 636 "	939 00		
	" VII. " 682 "	1,023 00		
		$7,069 92		$7,069 92

I hereby certify that I have examined the books and accounts of the Dominion Shorthorn Breeders' Association for the year ending December 31st, 1892, and that the above statement is in accordance with the same.

G. A. Savage,
Chartered Accountant.

Toronto, Jan. 13th, 1893.

Special Notice—Changes at Annual Meeting, 1893, in By-laws.

Section 2, entrance fee changed from $5 to $4.

Section 15, fees for registration changed to read : To members, registration and certificate, 75 cents ; to non-members, registration and certificate, $1.25.

Over age, double fees ; in all cases a certificate goes with registration ; change of ownership, 25 cents ; duplicate certificate, 25 cents.

Minutes of Executive Committee.

A meeting of Executive Committee of Shorthorn Breeders' Association was held at the office of the Secretary on February 10th, 1893.

Members present : A. Johnston, Greenwood ; John I. Hobson, Mosborough ; Ed. Jeffs, Bond Head ; David Rae, Fergus ; Wm. Linton, Aurora ; W. G. Pettit, Freeman ; F. I. Patten, M. D., St. George ; W. J. Biggins, Clinton ; Jas. Russell, Richmond Hill ; Thos Russell, Exeter ; Jas. Hunter, Alma ; C M. Simmons, Ivan, and H. Wade, Secretary.

In the absence of Richard Gibson, President, and John I. Davidson, Vice-president, Mr. Arthur Johnston was elected chairman.

The minutes of the Executive Meeting of Oct. 4th, 1892, were read by the Secretary and confirmed.

A letter was read from Richard Gibson, to the Secretary, from Chicago, regretting that important business would prevent him from being able to attend the annual meeting this year, and requesting him to bring before the Executive Committee the following points :

1st. I advise the Executive Committee to secure the room lately occupied by the Deputy Commissioner of Agriculture, now vacant.

2nd. That a code of office rules similar to the American Shorthorn Association be adopted.

3rd. That the printing and binding be let by tender unless we are getting a cut rate from the present printers.

4th. I think some sort of recognition should be made by the Executive, of the services renders to the Shorthorn interest by the present Minister of Agriculture, the Hon. John Dryden. No one knows except those who labored with him in the early

history of the British American and present herd book, the assistance rendered by him in that work, and I am sure it would be as acceptable to him as gratifying to ourselves to recognize his efforts in some way, even if trivial. Mr. Gibson then said, "I need not urge upon you the necessity of especially bringing before the annual meeting the importance of making a good exhibit at Chicago, and especially try and get an interest taken in the Shorthorn dairy cow exhibition."

A Committee, consisting of W. G Pettit, John I. Hobson, Wm Linton, Jas. Russell and C. M. Simmons, was appointed to consider and report at the annual meeting as to what the Association should do to compliment the Minister of Agriculture.

A report was then read by Dr. Patten from Mr. Geo. Savage, in which he said the books at the office were well kept, but suggested that a few changes might be made in giving out certificates and transfers from books with stubs and numbers to aid the Auditors in checking receipts.

Dr. Patten then read the following Finance Committee report:

Report of Finance Committee.

Your Committee beg to report as follows: After going over the books of the Association sufficiently to give us an insight into the mode in which they are kept, we concluded that it would be to the interest of the Association to employ a Licensed Accountant to audit the books of the Association and to make any suggestions he might think proper with regard to the same, and the system of book keeping adopted in the office

Acting on this belief we employed Mr. Savage, of London, who reports to us that he found the books correct, in so far as he was able to ascertain from the present system of book keeping and checks on receipts. He, however, recommends certain checks on receipts which do not at present exist, and your committee fully concurs with him in recommending that such steps be taken by our successors.

Your committee further recommends the following changes, in order to simplify and make receipts more uniform for registration fees, this being one of the principal sources of revenue, viz, members to be charged the uniform fee of 75 cents for registration and certificates. No pedigree to be recorded without certificate being issued for the same. Non-members to be charged the uniform fee of $1.25 for registration and certificate. No pedigree to be recorded without certificate being issued for the same. We recommend that new members' fees be $4 in the future instead of $5 We also recommend that the initiation fee of one dollar to new members be done away with, and for the future the uniform fee of $4 be charged to join and continue membership to this Association. These changes to come in force on the 1st of April next.

We cannot see our way to recommend any reduction in the staff at present employed in the office; but we would recommend a strict enforcement of office rules and hours, viz., 9 a.m. to 12 noon, 12 30 p.m to 4 30 p.m., and we recommend giving Mr. H. Wade, the Secretary full control and power to enforce such rules and hours.

(Signed) Arthur Johnston,
Chairman.

Moved by Wm Linton, seconded by C. M Simmons, that the above report be adopted. Carried.

The Secretary then read the Seventh Annual Report, and on motion of Dr Patten, seconded by Thos. Russell, the report was adopted as theirs, by the Executive Committee.

The Committee then adjourned.

Capt. Robinson: There is a question I would like to ask as there seems to be some trouble If a member had been a member since its inception and paid his annual fee, how many herd books is he entitled to? I merely ask this question as I have heard some murmurings about some members not receiving their herd books as they ought to.

The Chairman: Certainly, they should receive the whole of them.

The SECRETARY: I would like to explain there were two volumes printed in one year, and that has always been considered extra.

Mr. DYER: I do not see the object of giving these certificates. Especially for a small breeder who perhaps is poor and cannot pay out much; of course it is different with the larger breeders.

Mr. HOBSON: I thought it was agreed to be a suggestion by the Executive Committee that in future before any certificates would be given that the name of the owner of the service bull had to be given to those asking for registration. I know it was carried unanimously at one of our Board of Directors' meetings.

The SECRETARY: It was only passed last year. All the new forms have that column.

Moved by C. W. SIMMONS, seconded by Mr. PETTIT, that the report of the Executive Committee be received and adopted. Carried.

The Report of the Finance Committee was then read by the Secretary, and, on motion of Mr. LINTON, seconded by Mr. SIMMONS, it was adopted.

The CHAIRMAN: We hope to be able to reduce the membership fee a dollar. My opinion is it should be $3 for old members and $4 for new members. That was my judgment but I was overruled in that matter.

Mr. HOBSON: I think when this question is put of reducing the membership fees it would be well to run another year before we reduce them. Of course, you know that we who have been directors for a number of years have been put to a considerable amount of personal expense in coming down here. A great many people have made a considerable money sacrifice in this matter, and I think it well before making any reduction that it should be quite clear that we have sufficient money on hand, so that we would not be likely to get into the difficulties we did a few years ago, when we had to make an appeal to the Government to publish our herd book.

Mr MILLER: This matter of issuing certificates is one that has been brought up by nearly every Association in America for the past few years. It has been the rule in many of the Associations that they issue certificates only when they were required by those making their registrations. That has led to a great deal of trouble in every Association where it has been the custom. Every Association I am connected with has made it a matter—and I say it is a great matter—of charging a uniform registration fee and issuing a certificate to every gentleman. Mr. Dyer says this will injure some of our small breeders. Well, sir, I think if Mr. Dyer had as much to do with the issuing of pedigrees without certificates as I have he would go a little further and say he would not issue one without, for the trouble comes with men who in the first place had nothing to do with issuing the pedigrees or certificates. We go and see a bull, and we find no certificate has been given of that animal recorded, and that leads to endless complications and trouble on all hands. All know that who buy and sell them. If we want to keep this Asssociation in the same position that all Live Stock Associations are taking in America to-day we have to make this improvement, and I think it is a great one. I would not only go as far as this Committee has recommended us to go to-day, but I would also make one other step in advance. In certain of the Live Stock Associations they issue a report annually giving a full statement of every dollar and of every cent of fees that have been paid by the different members of the Associations—they issue a full report stating how much I have paid and how much each member has paid for registrations. I believe this is not only a check on any wrong being done, but it is also a check on any mistake being made; and I think our Secretary, knowing him as I have ever since I was a small boy, at any rate, will be very glad to have everything placed before every member of this Association in such a way that they will be perfectly satisfied and know to a certainty that everything he is doing was perfectly correct.

Mr. LINTON: If I had my way I would do away with certificates altogether. My opinion is, we would pile up books, and we will have to hire a room very soon to keep them in. They are no earthly use to any man who has a herd book. I think you will

not be able to sell the herd book as long as you issue certificates. They do not do it in England and should not do it here—unless in exports, if a man wants an export certificate; but it is no use to a man who has the herd book.

The CHAIRMAN: I will say for one with regard to Mr. Dyer's statement that it might press hardly on a poor man. I think it is in his interests and protection. Mr. Dyer can write very well, and so can I, and we can keep our records, but there are a great many poor and uneducated men that have no other way of keeping a record of their cattle than by these records.

Mr. DYER: They have the herd book to refer to.

The CHAIRMAN: A great many have not.

Mr. SIMMONS: When taking this work in hand and bringing in a good report I think it would be wise on our part to adopt it for this year anyway. So far as reducing the membership fee is concerned I agree with Mr. Hobson in that I do not think it would be wise to do so at this time. Our society, only a few years ago, was considerably embarrassed, and now that we have a few dollars ahead I would not be ready to reduce charges so soon. Our Executive has power to take action, and I think it should go one year longer at least. I believe when the year goes around we will all be willing to admit and agree that it has been a move in the right direction.

The CHAIRMAN: In regard to this matter of the old members suffering and the new ones being at an advantage, I think it is in the interest of the old members to reduce it a dollar as it will induce them to join.

The SECRETARY: Although we have a famous bank account amounting to $1,334.12, in the near future Volume Nine has to be paid for, and so within a few weeks we will be called upon to pay some such amount as that, and although it looks as if we had a lot of money, it will soon be used up.

Capt. ROBINSON: Before adopting that report it might be wise to discuss this matter fully. From my experience it would be a great mistake to do away with certificates. I have found that in selling several young bulls or heifers buyers are very anxious to get these certificates, and in one case I lost one and the man was very much put about until he got it again. It might be well to insert in that that in case of any extra certificates being wanted the extra charge would be so much.

The SECRETARY: That is already arranged for.

The CHAIRMAN: In the North west Territories if the stockmen had not brought the certificates there the people would not be allowed to show their animals, and everybody submitted to that rule, and it had to be applied.

Mr. HANLEY: I think in every case I should have a certificate. I feel very strongly the force of the remarks that have been spoken in that respect, and I for one do not want to get a pedigreed animal without a certificate. I feel, if our finances can stand it, the Association might in the future grant a certificate for every animal recorded with a fee of fifty cents but that is the only change I can see possible.

Mr. JAMES RUSSELL: I was the mover and originator of that scheme; I do not care whether a breeder has fifty or sixty head of cattle or whether he had five or four, because the public or buyer with those certificates can judge what he is buying. I consider it a great help, and for my own part if I had to pay a dollar apiece I would have them. At the same time it is at your pleasure to adopt it or reject it.

The CHAIRMAN: The question is on the adoption of the Finance Committee's report as read by Mr. Wade. The motion was carried.

Dr. PATTEN: Before the adjournment I think it would be necessary to appoint a committee to see about getting the printing done and some other matters that have to be attended to, unless you leave it in the hands of the Secretary.

The CHAIRMAN: I think it would be well to leave this still in the hands of this Executive.

At 12 o'clock noon the meeting adjourned to 1.30 p.m.

Business was resumed at 1.30 o'clock.

The CHAIRMAN : I regret that the President of the Association has not been able to put in an appearance. We have just received a letter from him which has been delayed in the post office. He wrote on the 8th from Chicago to say that he exceedingly regretted that he could not be here and desiring the Secretary to explain the matter.

ELECTION OF OFFICERS.

The election of officers was then proceeded with and resulted as follows :

President : R. GIBSON, Delaware, Ont.

Vice-President for Ontario : ARTHUR JOHNSTON, Greenwood, Ont.

" *Quebec* : D. BRIMS, Athelstane, Que.

" *Nova Scotia* : Prof. GEO. LAWSON, Halifax, N. S.

" *New Brunswick* : JOSIAH WOOD, M.P., Sackville, N. B.

" *Prince Edward Island* : Hon. D. FERGUSON, M.P.P., Charlottetown, P. E. I.

" *Manitoba* : JOHN E. SMITH, Brandon, Man.

" *North-west Territories* : JAMES GEDDES, Calgary, Alba.

" *British Columbia* : J. H. LADNER, Ladner's Landing, B. C.

Directors : J. I. Hobson, Mosboro' ; Thomas Russell, Exeter ; Edward Jeffs, Bond Head ; James Hunter, Alma ; Wm. Ballantyne, Stratford.

Auditors : F. E. Shore, London ; F. Green, Jr., Toronto.

Delegate to Toronto Industrial Exhibition : R. GIBSON, Delaware.

" *Central Farmers' Institute* : E. JEFFS, Bond Head.

" *Cattle Breeders' Association* : A. JOHNSTON, Greenwood.

" *Western Fair* : A. BROWN, Iona ; C. M. SIMMONS, Ivan.

" *Hamilton Central Fair* : W. G. PETTIT, Freeman.

" *Montreal Exhibition* : R. R. SANGSTER, Lancaster ; H. J. ELLIOTT, Danville, Que.

Executive Committee.

A. List—EDWARD JEFFS, Bondhead.
WM. BALLANTYNE, Stratford.
JAMES HUNTER, Alma.
T. RUSSELL, Exeter.
JOHN I. HOBSON, Mosborough.

B. List—W. J. BIGGINS, Clinton.
J. L. COWAN, Galt.
JAMES TOLTON, Walkerton.
WM. LINTON, Aurora.
F. I. PATTEN, St. George.

C. List—ROBT. MILLER, Brougham.
JAMES RUSSELL, Richmond Hill.
JOHN ISAAC, Markham
W. G. PETTIT, Freeman.
C. M. SIMMONS, Ivan.

Agriculture and Arts List—
W. C. EDWARDS, M.P., Rockland.
JAMES ROWAND, M.P., Dunblane,
J. C. SNELL, Edmonton.
A. RAWLINGS, Forest.
WILLIAM DAWSON, Vittoria.

Secretary and Editor, to whom all communications are to be sent.

HENRY WADE, Toronto

The SECRETARY then read the following minutes of a meeting held at Guelph :

CATTLE BREEDERS' ASSOCIATION.

Mr. WADE moved that Mr. Snell take the chair.

Mr. SNELL said the object of the meeting was to consider whether it would be advisable to take steps to form a Cattle Breeders' Association.

Mr. GIBSON said that it was necessary that there should be a Cattle Association formed, but he thought it would be stronger to make it a Live Stock Association, including sheep and swine.

Mr. SNELL said that the Americans have their National Swine Breeders' Association and a Stock Breeders' Association, which includes horses and all, and that it was a question whether it would be advisable to include all this in one Association or not, and he thought that only representatives of Cattle Breeders' Associations had been invited to this meeting.

Mr. GIBSON said that he would change his motion and say that it was desirable to form a Cattle Breeders' Association.

Mr. RAWLINGS said that if they could get a strong association, they would have more power in the country and get a better hearing from the Government.

Mr. HOBSON thought it would be rather a difficult thing for the Minister to give a grant to a Live Stock Association, composed as it is now, and also give us a grant. He also thought we had better confine ourselves to a Dominion Cattle Breeders' Association, for the reason that the Sheep and Swine Breeders' Association was working smoothly, and that if we could form an Association on a similar basis; then it would come in properly to raise the question as to having a Stock Breeders' Association, including all the different classes of stock.

Mr. CHURCHILL thought it would be to the interest of the cattle breeders of this country to join in an Association, and he thought it would be well to have a strong committee to take part and draw up a constitution. Then we would know what we are going to do. Of course, we have an idea that we are going to form an Association, but the aims and objects are not before us, and to form an Association before we know what we are going to do would be unsatisfactory.

Mr. MARTIN thought it well to form a Dominion Cattle Breeders' Association, which would strengthen our hands now.

The motion was carried to form a Dominion Cattle Breeders' Association.

Mr. HOBSON thought the Committee should be composed of one member representing each of the different breeds.

It was thought better to appoint a committee at once, to draft by-laws and take into full consideration the whole matter connected with the formation of such an Association, and meet at nine o'clock the next day.

It was moved, seconded and carried that a committee be formed of one member from each of the Cattle Breeders' Associations, and that they report to an adjourned meeting at nine o'clock the next day.

It was moved, seconded and carried that Mr. Gay be on the Committee, representing the Ayrshire Breeders' Association.

It was moved, seconded and carried that Mr. Rawlings be on the Committee, representing the Hereford Breeders' Association.

It was moved, seconded and carried that Mr D. E. Smith be on the Committee, representing the Holstein Breeders' Association.

It was moved, seconded and carried that H. Wade, Esq., be on the Committee, representing the Shorthorn Breeders' Association.

It was moved, seconded and carried that Mr. Gibson be on the Committee, representing the Guernsey Breeders' Association.

It was moved, seconded and carried that Mr. Snell be on the Committee, representing the Jersey Breeders' Association.

It was moved, seconded and carried that Mr. D. McCrae be on the Committee, representing the Galloway Breeders' Association.

At the conclusion of the reading of the above minutes, the Secretary read letters in relation to milk tests from H. H. Hinds, Stanton, and F. Martindale, of York, Ont.

Mr. HOBSON: I think that some acknowledgment should be made to the Hon. Mr. Dryden for his services rendered in the Shorthorn interests in this country. A sub-committee was appointed and I drew up this: "The sub committee appointed by the Executive Committee for the purpose of talking steps with the view of acknowledging in some way the very valuable services rendered by the Hon. John Dryden in the interests of the Shorthorn breeders of this country, would beg leave to report that they advise that he be elected a life member of the Shorthorn Breeders' Association, and that a testimonial be purchased and that such presentation with a suitable address be presented to the honorable gentleman at a time to be agreed on by the Executive Committee.

Moved by Mr. LINTON, seconded by Mr. SIMMONS, that the report be adopted. Carried.

The CHAIRMAN: I would like to ask Mr. John Hope whether anything further has been published as to scheduling cattle or any intention as to any exception being made of dairy cattle or show cattle of any kind.

Mr. HOPE: I may say that I have not had anything definite. I have sent two telegrams to Washington now, and I have no reply to either, so I cannot give you any definite information.

Secretary WADE: Mr. Awrey telegraphed to Mr. Buchanan, and we have had no answer as yet.

Mr. IDINGTON: What was proposed to be done with the English exhibits suppcsing they sent stock? There was some regulation adopted in regard to that, and no doubt the same regulation would apply to anything we send.

Mr. HOPE: They require a quarantine of ninety days, that is all. I do not think there is any doubt but there will be something done at the time the cattle will have to go. Anyone that will send cattle there will have to get them in order in time to go and I do not think they will shut them out. Arrangements will have to be made before anything can be done definitely.

The chairman called upon Mr. N. Awrey, M.P.P., to speak.

ADDRESS BY MR. N. AWREY, M.P.P.

I do not intend to occupy your time but a moment or two. I had a desire to address you upon one subject, that is, the dairy test that is to take place at Chicago amongst the different breeds of cattle. There was a request by leading gentlemen—in fact it was the president of the Shorthorn Breeders' Association of the United States, asking me what steps had been taken to have representation from the Shorthorn Breeders' Association of this province. The Jersey club are taking very active interest, through Valancey Fuller, and you have all recollection of Valancey Fuller, at least by reputation, if you have not a personal acquaintance That department is under his care, as far as the Jersey club of the United States is concerned. He is a wise man, in some particulars at any rate. He has already selected the Jersey cattle, made arrangement with the authorities at Chicago to have the stables prepared, and in fact part of the cattle are there now so they may become domesticated, used to their surroundings When the test is made they will give all the milk that it is possible for them to give under the most favorable circumstances. The most of them are supposed to drop their calves in Chicago, so they will feel as much in their homes as in their own stables. The Shorthorn Breeders' Association of the United States are very anxious to have assistance from the Province of Ontario. I wrote them that this matter I thought should be left entirely in your hands. I wrote Mr. Gibson, your then President, and said to him and Mr. Dryden that

this was just one of the cases in which you gentlemen were more directly interested than any other class in Ontario, because practically it is a test as between the different breeds. While we know that the Shorthorns for beefing purposes are no doubt without exception one of the very best breeds of cattle in the world, it is contended in some quarters that for dairy purposes the milking strains are so poor that you cannot compete with the others. This competition will forever establish the reputation of the breeds for dairy purposes; there is no doubt of that. Now, I understand that there are in Canada three or four cows whose records for giving milk as to quantity and quality is very fine. They ask us to furnish them with three or four cows. The entire expense will be paid by the authorities. What we say to you, however, is, select your cows, send them over there, in order that you may help your brother breeders of the same kind of cattle that you are interested in, if possible, to make a good showing there. The Government will pay the cost of the transportation over there, they will pay the cost of maintenance, and they will pay the cost while in quarantine, and pay the cost of coming back. The Dominion pays the cost of going and coming and the Ontario Government while there.

Something has occurred during the last two or three days that will be a drawback, for they have scheduled our cattle. It is not officially known yet. However, it has been published, and while officially at Ottawa they have not received an intimation of it yet, I am afraid it is too true. I have very strong opinions that if they will not relax their regulations in that particular that we as Canadians should positively refuse to exhibit cattle in any case. There is no doubt about that. (Hear, hear.) I therefore telegraphed last night to Mr. Buchanan, knowing you were to meet to-day, asking for an answer. I expected some time to-day an answer would be here before your meeting had closed, as to whether they intended these regulations to apply to cattle intended as exhibits at Chicago. I expected an answer some time to-day; I am writing him a very straight letter. I think the stockmen of Ontario will bear me out if I take the ground, and take it strongly, that we refuse to exhibit cattle at all if they intend to ask us to keep them in quarantine ninety days before they go over there and ninety days coming back. I think you will all agree with me that there is no contagious disease among the cattle in Canada. The mistake has been made in scheduling our cattle in Great Britain—it was a serious blunder. I think it was an unwarranted step as far as the Department of Agriculture in the Old Country is concerned. They have taken advantage of that to schedule our cattle going into the United States. Perhaps we cannot blame them very much when the Old Country people say our cattle are diseased. It is not very much to be wondered at if they take advantage of it and say, "Well, if your very best friends, if the mother land, is afraid of your cattle, it is natural we should be a little afraid." Now, there are ten cases of diseased cattle in the United States where there is one here or none here. There is no doubt about that, because they are not clear of disease of that kind. I have had a desire to say these things to you to know as to whether I shall have the approbation of you men if I go as far as to say we will refuse to exhibit if it is continued. If you say you are prepared to go and submit to a quarantine of ninety days I am very willing to take your advice in that matter, or do you prefer I should take the ground that we will make no exhibit in any case. We depend altogether upon the stock men of the Province of Ontario to make an exhibit for the Dominion. The commissioners for the different provinces met in Ottawa not more than three weeks ago. They said to us that in most of the classes the other provinces depended altogether upon Ontario to make the Dominion exhibit, or practically the Dominion exhibit. In sheep and hogs there is no intention to exhibit a single animal from Quebec, and I am doubtful if there will be any from any of the maritime provinces. The reason they give is, when they hold their provincial exhibitions you come from Ontario and take all the prizes, and they say if you beat us there, there is no use trying to compete in Chicago. Well, if this is the case, it behooves us in Ontario to take more active efforts than we otherwise would. Ninety per cent. of the sheep and pigs Ontario must furnish, seventy five per cent. of the horses we must furnish, and I think eighty per cent. of the cattle we must furnish. To all intents and purposes the Ontario exhibit must be considered the stock exhibit from the Dominion; so you must remember, gentlemen, that the responsibility is heavier upon you than it should be perhaps, because you have not only the reputation of the Province of Ontario, but you have the reputation of the entire Dominion in your keeping as far as two or

three classes of stock is concerned. Your president, Mr. Gibson, and associated with him two or three other men, are taking interest in selecting the stock. I think you have confidence in these men. I have not a doubt but that you men have confidence in these five or six men, because there is Mr. Gibson, Mr. Hope, Mr. Snell, Mr. Yuille, Mr. Davidson, Mr. Graham, Mr. McCormick. There are a dozen pretty good men selecting stock We believe, after all, with the combined judgment of all these men the stockmen of the Province of Ontario should have implicit confidence in In the directions I gave to these men, I said: Select nothing but first class stock, it makes no difference to whom they belong, if it was a good animal take it, if it was an inferior animal reject it; because you will agree with me, we want no animals in Chicago that will not at least reflect some credit on the people of the Dominion. Those were my instructions I had not any fear; they were men I could not interfere with if I had a desire. I make them responsible for a selection of good cattle, and I rely upon you to assist them Taking it all together I think I have good backing in the Province of Ontario. If I have all the stock men taking an interest in it, having six, or seven, or eight of your most expert judges, placing all the responsibility upon them, I think I can fairly say that I have left all this work in good hands. I ask your assistance and active co-operation, for it is your work as much as mine. Governments can do considerable, and a commissioner can work hard, but without your active co-operation the entire exhibition would be a failure, because, after all, you are the people, and without the assistance of the people, our efforts would be in vain. I thank you, Mr. Chairman, for your kind invitation to be here I am glad to have said these few words to you, and would be glad now for an expression of opinion upon this one subject I have mentioned, as to whether you will strengthen my hands, whether I shall demand free admission to exhibition there. (Applause.)

Moved by Mr. Hobson, seconded by Mr. John Idington, that it is the opinion of this Association that there does not exist, and has not existed for years in Canada, any pleuro-pneumonia; that if the quarantine regulations of the United States, as proclaimed by secretary Rusk, are not modified in favor of exhibits so as to permit them to be shown at the Columbian Exhibition without such quarantine, the commissioners for the Dominion and Ontario should refrain from making any exhibit of cattle.

Dr. Patten: With regard to the resolution I think it is hardly worded strong enough; if there is any objection to find to it at all, and if there is no remedial measure made by the United States, I for one would express the opinion that we of Ontario, exhibit no cattle whatever under any circumstances, unless these restrictions are removed Motion carried.

Dr. Mole: There is one thing in regard to scheduling cattle, I would like to hear some expression of opinion on, and that is as to why Great Britain has taken to scheduling Canadian cattle. I think it is a very important subject, and I think it is one that ought to be brought forward by our Dominion Government before the British Parliament. They cannot be blamed for scheduling Canadian cattle, for this reason: Who is there can say those cattle did not suffer from pleuro-pneumonia when they landed in Great Britain? I express the opinion that not a man in this country could. Did not they contract it going across the Atlantic? If there is any gentleman here who has had any experience in the way those cattle are herded across the Atlantic they can understand how it is so easy to contract this disease. Another thing I would say in regard to it is, that our Government should petition the British Government and say: "We are doubtful if any pleuro-pneumonia exists in Canada; how can you prove it?" No newspaper statement would make it evident to the British Government. Why not get a petition from the people, cattle breeders in this country, and shippers, and say: We have no pleuro-pneumonia in this country, and if these cattle presented pleuro-pneumonia they must have contracted it after they left Canada. We all complain about Prof. Brown scheduling cattle. He is not to blame, he has his position to look out for. At one time I was an inspector of cattle in Ireland, for the Irish stockers sent over to Great Britain, and there is no doubt in my mind that Ireland is the great centre from which pleuro-pneumonia is disseminated.

Mr. Russell: I expected we would get a reply from the Minister of Agriculture either for our Province or for the Dominion, and I claim that the stock breeders are badly used by these gentlemen in not saying "yes," or "no," or what they intend to do. I say, as an exhibitor, that we have not been treated fairly as to what expense we are to be at. There is no breeder to-day can tell whether he can go over there with three, or four, or five, or a dozen. There is no understanding as to how he is to be treated. I am prepared to show a good herd of cattle, providing I know what they are going to do with it. Let them say whether they want us to get up three, or four, or five, or a herd. I have entered nine, and if they do not take nine I will not take any.

The Secretary: I think the last communication we had from Chicago says that they will take what cattle we thought fit to send, so I think you can rest perfectly easy. We will take everything of yours that the Commissioners will pass; they will take a full herd or individual animals.

Mr. Russell: In reply to you in that I do not know whether I can fill out these herds. I do not know whether it is worth my while to try to show or not. Perhaps with the purchase of one or two I can fill out a herd, but I have left it to the last minute to know whether they will say yes or no.

The Secretary: They will take all the Shorthorns that you can exhibit.

Mr. Hope: I think Mr. Russell has taken good grounds and very sensible position. I think he has a very strong desire to be loyal to Canada, and I am very sorry to say many of our breeders have not had that same spirit. The Commissioner should select the animals as soon as possible, and give them an opportunity, because there is a great number of Amerians have been over here, and some of our breeders I am very sorry to say, have not been as loyal as they ought to have been in a case of this kind.

Moved by Mr. John Hope, seconded by Capt. T. Robinson, that there never has been any pleuro-pneumonia cases in Canada except in the case of some cattle imported and quarantined at Quebec some years ago, and this Association protest emphatically that the regulations now in force in Great Britain scheduling Canadian cattle should not be continued, and that we shall endorse any action the Dominion Government may take in going to any expense to furnish the evidence of the facts necessary to bring about a rescision of the order; and that a copy of this resolution be forwarded to the Minister of Agriculture at Ottawa. Carried.

The meeting then adjourned.

Meeting of New Executive Committee After Annual Meeting.

Toronto, February 10th, 1893.

Members present: A. Johnston, chairman; Dr. Patten, W. G. Pettit, Ed. Jeffs, Wm. Linton, J. Russell, T. Russell, W. J. Biggins, Robt. Miller, C. M. Simmons, Wm. Ballantyne, John I. Hobson and James Hunter.

On motion of Wm. Linton, seconded by W. J. Biggins, Messrs. A. Johnson, F. I. Patten and James Russell were reappointed on the Finance Committee.

It was resolved that the new rules as to registration and members' fees come in force on the 1st of April next.

And that the matter of renting a room from the Agriculture and Arts Association be left to the Finance Committee, and that they meet on either the 9th or 10th of March, at the time of the meeting of the Agriculture and Arts Association.

Meeting then adjourned.

THE CANADIAN CATTLE BREEDERS' ASSOCIATION.

The annual meeting was held at the Rossin House on March 8th, 1893.

The following members were present: Hon. Thomas Ballantyne, President, Stratford; R. Marshall, Edmonton; D. McCrae, Guelph; Wm. Weld, London; J. Y. Ormsby,

Danville, Que. ; Albin Rawlings, Forest ; Caleb Rawlings, Ravenswood ; Richard Gibson, Delaware ; J. C. Snell, Edmonton ; Wm. Dawson, Vittoria ; F. A. Fleming, Toronto ; J. Sissons, Crown Hill ; D. E Smith, Secretary, Brampton.

Owing to the President's absence at the commencement, Mr. R. Gibson occupied the chair until he arrived.

The minutes of the last meeting were read by the Secretary. Moved by Mr. McCrae that they be confirmed. Carried.

The following names were received as those of representatives to the Dominion Cattle Breeders' Association :

Shorthorns : Arthur Johnston, Greenwood ; J. I. Hobson, Mosboro.

Ayrshires : Jas. McCormack, Rockton ; D. Morton, Hamilton.

Herefords : F. A. Fleming, city ; H. D. Smith, Compton, Que.

Guernseys : J. Y. Ormsby, Danville, Que. ; S. A. Fisher, Knowlton.

Jerseys : J. C. Snell, Edmonton ; Capt. Rolph, Markham.

Galloways : D. McCrae, Guelph ; Wm. Kough, Owen Sound.

Holsteins : R. Marshall, Edmonton ; D. E. Smith, Brampton.

Devons : W. J. Rudd, Eden Mills ; S. Harper, Cobourg.

Polled Angus : Jas. Cochrane, Hillhurst, Que. ; Wm. Stewart & Son, Lucasville.

Mr. Fleming wished to have an idea of the Constitution as he was not at the Guelph meeting. The Constitution of the Cattle Breeders' Association of Canada was then read by the Secretary, and several points were explained by Mr. R. Gibson.

Mr. Gibson : There is one thing strikes me we might do at the present time, and that is to draft a resolution expressing our belief that Canada is free from disease, and has never had pleuro-pneumonia outside of the quarantine.

This was discussed by the members, and finally Mr. Albin Rawlings moved, seconded by Mr. Caleb Rawlings, that Mr. Gibson, Mr. J. C. Snell, Mr. D. McCrae Mr. Smith and Mr. Green, be a committee to draft a resolution affirming the fact that no contagious pluero-pneumonia is now nor ever has been in our country, and forward the same to the Minister of Agriculture.

The resolution of the Committee read as follows : "The meeting of representatives of all breeds of cattle in the Dominion of Canada desire to state in the most positive and emphatic manner that there has never been a single case known of contagious pleuro-pneumonia in any herd in Canada, and that had such existed it would most certainly have come to their knowledge."

Revision of the Constitution.

A revision of the Constitution took place with the following result : In Article Six in Section 2, "proxy" was struck out. Article Eight was also partly struck out.

Moved by D. McCrae, seconded by J. C. Snell, that the Constitution as read clause by clause be adopted as a whole. Carried.

Committees.

The following Committees were appointed :

Registration : J. C. Snell, F. A. Fleming, Jas. McCormack.

Exhibition of stock : H. D. Smith, W. Kough, W. Rolph.

Legislation : A. Johnston, Dr. Ormsby, James Cochrane.

Live stock : D. McCrae, S. A. Fisher, J. I. Hobson.

Moved by D. McCrae, seconded by R. Gibson, that the committee on Legislation, A. Johnston, Dr. Ormsby and Jas. Cochrane, be a committee to wait on the Dominion Government to obtain a grant. Carried.

The meeting then adjourned.

DOMINION AYRSHIRE BREEDERS' ASSOCIATION.

The sixth annual meeting of the Dominion Ayrshire Breeders' Association, was held at Shaftesbury Hall, Toronto, on the 9th day of February, 1893, at 2 o'clock p.m.

The meeting was opened by the President, Mr. THOMAS GUY, occupying the chair.

The following members, among others, were present: Jas. Yuill, Carleton Place; J. McCormick, Rockton; J. Knight, Elginburg; Alfred Brown, Bethel; John Stokes, Thomasburg; Duncan Brown, Iona; David Morton, Hamilton; John Crosby, Campbellford; M. Ballantyne, St. Marys; W. Stewart, Jr., Menie; Walter Nicol, Plattsville; W. W. Ballantyne, Stratford; C. M. Simmons, Ivan; H. E. Eyre, Harlem; Secretary, Henry Wade, Toronto; Wm. Mole, Toronto; Edward Jeffs, Bond Head.

President GUY: As it devolves on me to say a few words on this occasion by way of introducing the general business of the Association I shall not attempt to discuss the origin of Ayrshires. The subject of breeding in its various relations both for fancy and profit has been so thoroughly treated by men far more competent than I am that I fear I should not be able to add anything that would be interesting. My remarks, therefore, will be brief, and I will allow the time to be occupied by those gentlemen who have kindly gotten up papers to read to us on these subjects. Agriculture at the present time, I am sorry to say, is under a cloud. The price of nearly all kinds of produce is extremely low. In this depressed state of things many farmers are turning their attention to dairying, which at the present time is looked upon as the best spoke in the wheel. Closely associated with this branch of farming are the Ayrshires, which by the consent of the great majority now occupy the foremost position amongst the dairy breeds of this country as well as of Scotland. This is evident from the numbers shown at the different exhibitions and the interest and enquiries manifested by the general public. Their superior milking qualities, their beautiful forms and colors, their hardiness to live and thrive on frugal fare, and their aptitude to fatten when no longer able to fulfil the duties of the dairy must always make them favorites where dairying engages the attention of the agriculturist. I would here remark that I have had cows that have bred and been in milk every year up to twenty years of age, having produced a calf every year from two years old, and at the twentieth year fattened and sold them off for beef.

To maintain their position I would take this opportunity of impressing upon all breeders the importance of only breeding from good milkers. Sometimes indifferent milkers may be retained in the herd because they produce good commercial looking animals. These may be profitable for the time being when such are sold young, but must eventually result in disappointment to the buyer and injure the reputation of the breed and breeder if persisted in. More especially is this the case in keeping bulls off bad milkers. Breeders should consider the damage that a bad milking strain must cause in a herd, and that it will take years before the effects can be eradicated. I therefore would impress on all breeders to bear in mind the fact that milk production is mainly the sole object of Ayrshire cattle, and to ruthlessly discard all bad milkers, however good otherwise, from their herds. Breeders should also endeavor to overcome the objection often raised against Ayrshires by improving and enlarging the size of their teats. It seems to be a natural defect for Ayrshires to have small teats. This deters a good many from adopting them. Milkers generally want something to grasp in their hand instead of using their finger and thumb. The only way to remedy this, that I can suggest, I think will be to raise our bulls for use from cows that have the largest teats, and so in time to overcome this defect in that way. Ayrshire cattle have not been puffed or boomed as some other breeds have been. They have arisen to public favor simply by their own inherent merits, and this being the case they stand on a good foundation. Having tried them for thirty years I believe there is no other breed of cattle that will give as good returns for amount of food consumed.

REPORT OF EXECUTIVE COMMITTEE.

The Executive Committee beg leave to present the sixth annual report of the affairs of this Association, as furnished by the Secretary, for the year ending the 31st day of December, 1892.

Registrations.

We have recorded 343 animals of this breed during the last year, and have now 888 animals recorded for our second volume, not near enough yet to print.

Members.

We have added to our membership roll this year 21 new members, and 13 old members have renewed their subscriptions. The new members have had the 1st volume sent to them, and the latter will get the 2nd volume when printed. As our balance is necessarily very low on account of paying for the 1st volume of Herd Book for members, it will be necessary to consider whether members should pay every year or not.

We are pleased to see that Ayrshire cattle came well to the front last year at all the shows, and that a great many were chosen by the Inspectors to go to the World's Fair this present year. The chances are that a great many honors will come back from the World's Columbian Exposition, and it behoves all who are intending to exhibit to keep their cattle as well as possible for that great occasion. It is also gratifying to know that several more have been imported from Scotland this year, adding new blood to the old herds of Canada, and improving very materially the stock of this country.

FINANCIAL REPORT FOR 1892.

Receipts.		*Expenditures.*	
1892		1892	
Jan. 1st. To Cash on hand	$187 50	Jan. 27th. By Cash 57 Vols. to Members $2.70	$153 90
Dec. 31st. 34 Members' Fees	102 00	Feb. 4th. By H. Wade, Salary	50 00
		" Jos. Yuill, Expenses, per resolution	12 50
		Dec. 31st. 21 Vols. at $2.70	56 70
		" Balance Cash on hand	16 40
	$289 50		$289 50

We, the undersigned, have audited the above accounts and find them correct.

Toronto, February 9th 1893. ALFRED BROWN, Bethel.

Moved by JAMES MCCORMICK, seconded by Mr. BALLANTYNE, that the report be adopted. Carried.

The Secretary then read his sixth annual report, and on motion of Mr. STEWART, seconded by Mr. J. KNIGHT, the report was adopted.

Mr. MCCORMICK: I might say that in this matter of sending a delegate to the Farmers Institute, that I do not think this society is benefited by it so much that it would pay the expense. I think I would discontinue that. I think that money could be applied in a more profitable way in giving a prize.

AYRSHIRES AND DAIRYING.

The following paper, written by Mr. D. NICOL of Cataraqui, was read by the Secretary:

I do not think I can tell you anything about the Ayrshires which you do not already know. They have been an established breed for over one hundred years, and although they have never been boomed by speculators as other breeds have been, their reputation for usefulness has now become fairly well known. The demand for Ayrshires at present is far in excess of what it has ever been. No doubt this is chiefly because the leading branch of our agricultural industry now is the production of cheese, for which purpose milk of the Ayrshires, being rich in casein, is peculiarly adapted.

Fortunate it was for this country and people that dairymen's associations were formed at a time when almost everyone engaged in agricultural pursuits was becoming depressed by the unprofitableness of farming. Much of the land has been impoverished by continuous overcropping, and the scarcity and high price of skilled labor, along with the low price of many farm products. A revolution in farming operations had become actually necessary, and now the great majority of Ontario farmers are devoting special attention to the manufacture of first-class cheese, the demand for which seems to be almost unlimited, and the land resting is gaining in fertility,

The selling of milk in towns and cities has developed into an enormous business, and for that purpose the Ayrshires seem to be particularly well suited, because they give milk which gives general satisfaction to consumers. Analysts and physicians pronounce it nearly a complete food for children, invalids and aged persons; hence the ever increasing demand for it. As regards the butter made from the milk of Ayrshires, I have demand for much more than I can supply at 25 cents per pound. When the Travelling Dairy operated in our locality last fall, the milk of our cow Virgilia yielded by the Babcock test 5½ per cent. butter-fat. She was then giving 48 pounds per day.

I heard a dairyman say he would like to procure a breed of cows which would produce a large quantity of rich milk on a small quantity of poor food. We have now about a dozen different breeds of dairy cattle, each breed celebrated for some peculiarity, and all having their reasonable admirers. It is, however, hardly probable we shall ever possess a breed which will in itself have all the good qualities and peculiar advantages which this individual desired.

When in Shropshire, England, a few years ago, I was told by a large estate overseer, noted for wisdom and for extensive experience with the different breeds of dairy cattle, that in point of economy he had found none equal to the West Highlanders. Another dairyman said, he could get more quarts of good milk out of a ton of hay fed to the little Kerry cows than with any other breed. I was not prepared to gainsay their statements, but I do know that in the Ayrshires we have a compactly built, industrious, hardy, economical business cow, which has the faculty for assimilating her food into good milk, and that in the milk pail she readily responds to the treatment she receives.

I also know that in some breeds, and even among the common cows of the country, there are to be found phenomenal animals, which can be crammed to produce immensely, while at the same time a large proportion of them are poor producers. The accomplishment of a few extraordinary cows of any breed does not by any means decide the superiority of the whole.

One of the chief characteristics of the Ayrshire breed is that they are more uniform in productiveness, and that there are fewer culls or scrubs among them than is generally found among other breeds of dairy cattle; and I doubt whether there is any breed better adapted to the needs of the dairymen of Ontario.

Although we have gained a reputation for producing cheese of the very best quality, there is still much room for improvement in the butter industry. I believe there is more fine butter made now than formerly, yet there is a great deal produced which is not so good as it might be. No doubt much of the offensively odoriferous trash is made from cream too long kept without regard to temperature, but a great deal of it results from the want of cleanliness in the manipulation of the milk from which butter is made. We seldom hear of witches now, yet some allege they are not altogether extinct, and that there is still a mystical virtue in the horse shoe.

Before dairy thermometers were much in use I was once called upon to help a neighbor at churning. The husband and wife had been taking turn about at the dash churn all forenoon and had come to the conclusion that the cream was bewitched. After dinner I worked at it more than an hour, but could not keep the frothy stuff from overflowing, and then it became a question whether I also was not bewitched. A red hot horse shoe was dropped into the churn, and after a few minutes agitation the butter came. Perhaps some warm water would have answered the purpose fully as well, but I have no doubt that while that man and woman lived they believed the horse shoe drove the devil out of the churn. In several farming houses I have seen a horse shoe hanging over the kitchen door, but in only one instance have I seen that of a mule or an ass placed in such position.

I heard a person enquiring in Kingston market for servants' butter ; he said it lasted longer than the finely flavored delicacy. And I could tell you of a gentleman who procured a tub of butter for family use, but it soon became so rancid that even the servants would not eat it.

The Travelling Dairy delegation last fall in our locality imparted much valuable information to an appreciative audience. It was strange, however, that many who might have been greatly benefited did not avail themselves of the opportunity freely offered on that occasion.

It may well be said there are none so blind as they who will not see. A generous-hearted farmer in an adjoining country, having heard of the advantages to be derived from the use of the thermometer, brought home to his wife one of the best make. She put it in the churn along with the cream, set away for the night, removed it in the morning, churned as usual, and said that she did not see that it made much difference.

I have seen butter being made by persons of untidy appearance, and others, having seen the like, stopped eating butter ; and I know of some on whom the very sight of butter acted somewhat like an emetic. Consequently there is not nearly so much consumed as there will be when our reputation for cleanliness becomes above suspicion.

I have good hope in the rising generation, because I think the time is probably not far distant when this useful art will be taught in every common school throughout the country. We have much absurd talk about the drudgery of dairy work, but for my own part I cannot think of any pleasanter or more honorable occupation in which a woman could be engaged than in making delicious butter. Moreover, the healthiest, happiest and prettiest women I have ever seen were dairymaids.

It is encouraging to notice that women are now invited to the Dairy School in connection with the Ontario Agricultural College. A good sign of progress will be when many farmers' daughters are taking a short course at that institution.

Wise young farmers will marry educated dairymaids ; superstition will be dispelled, and our character for butter-making will be exalted, enabling us to compete favorably in the best butter markets.

Mr. McCormick : I move a vote of thanks to Mr. Nicol for his paper. I agree very strongly with one point, and that is to purge the herds of inferior animals. The profit may be made for a little time, but the result in the end is, it not only kills the bird that laid the golden egg, but it comes upon other parties as well. We began years ago ; when an animal was not suited to what was wanted we got rid of it, not as a dairy cow, but it went to the butcher. In this matter I think it would be good if all would follow the same principle, and one would not hear so much about cows that are sold that are not good.

Motion seconded by Mr. Knight.

HOW SHALL WE SELECT SIRES FOR DAIRY HERDS TO PRODUCE UNIFORM RESULTS.

Mr. Alfred Brown, Bethel, read the following paper :

The Ayrshires were bred in Scotland over a century since, for three principal products. The calves were fed in considerable numbers for veal, the males were also fed as steers up to three or four years old for beef, and the fittest animals were retained for the dairy. This system had many advantages, and is, perhaps, the system to which we are most indebted for the excellent dairy qualities of the Ayrshires of the present day. They are a prolific race of cattle and endure hardship and short pastures as well as or better than any of the other pure breeds.

Since the dairy interests have been increasing in volume from year to year, on both sides of the Atlantic, large numbers of this breed have been imported into Canada and the United States, and these animals and their decendants have been in good demand ; in fact the supply has not been equal to the demand, especially during the last decade. The consequence has been that some animals have been used for breeding that were deficient

in constitution, or other dairy qualities, and these have done as much damage to the reputation of the breed in that vicinity as ten good animals will regain. While this is true of the Ayrshires, it is equally true of the other dairy breeds, and it is the object of this paper to offer a suggestion to remedy the evil, the importance of which will not be grasped at the first impulse.

Of course, discussion on the subject, which should be carried on only with a view of doing the most good to the greatest number of dairymen, should interest all breeders, and thereby establish a more rigid system of selection, which would create an unlimited demand for animals bred on these lines.

A bull is admitted to be one-half the herd as far as the increase is concerned, and if he is a descendant from high milking stock, we might reasonably expect him to have more than half the influence on the progeny; or if the dam has also come of several generations of ancestors noted as milkers, we could safely count on uniform results. The power of animals to impart to their progeny certain qualities may be depended upon in proportion to the number of generations that these qualities have been prominent.

How very few animals of any breed can trace through four generations or thirty ancestors a uniform yield and quality of product?

This may be the result of a variety of causes, the principal ones in the dairy breeds being a weak constitution or a disposition to lay flesh on their own carcass instead of converting the food consumed in the most economical way to retain the animal in a healthy condition, and for the production of a good quality and quantity of milk, or may be the showing up of some defect in the early genealogy of the individual.

I do not think it too much to ask our registry association to assist in improving the breed and thus add to their value and usefulness. In connection with the herd book established in Quebec, the "Race Bovine Canadienne," there was formed a so-called "Book of Gold." The names of cows were admitted to that book only when they showed a record of milk yield equal to, I think, 6,000 lbs. per annum. This must be admitted by all progressive people to be a step in the right direction. A milk record or reliable test record attached to the pedigree of all pure bred cows and published in the herd book would be of great value. Some of our best dairymen are keeping private records, but this does not cover all the ground.

The herd book should tell the whole story; then we could make our selections without any trouble. To even the novice or inexperienced dairyman a convenience would be offered by which animals could be purchased on their merits by consulting the herd book.

Let us illustrate by taking a calf when dropped to be worth $40, if the dam and sire's dam were good performers, and $10 extra for each cross with animals having satisfactory milk records back four generations or eight crosses on both sides would show the value to be $200. In the veins of this animal would stream the blood and influence of thirty ancestors with satisfactory records.

Let us take the opposite side of this basis, and deduct $10 for each cross with animals that were not satisfactory milkers, and a bull might in this way be shown to be worth considerable less than nothing for breeding purposes, and a reliable estimate of the actual value of an animal could easily be obtained from the herd book.

It is doubtful if any person could trace the blood of their herd this far, even if they kept private records, unless the herd book adopted the same system. Especially would this be the case when it was necessary to get an infusion of new blood from other breeds. This system would be alike beneficial to all dairymen. Every pound added to each milking per cow for the Province of Ontario means 480,000,000 pounds more milk from 800,000 cows in three hundred days or a distribution of $3,600,000 at 75 cents per hundred, and assists to lessen the cost of production and increase the value of the herd. A short form could be used by giving on all pedigrees the dam's and sire's dam's record, which could be entered at time of registering, except in case of a heifer's progeny before she had fully grown to maturity. Or a separate record inserted in the herd book, and be made optional or compulsory as may be determined by the association. In regard to living cows of all ages, their owners could have their records placed in a future edition of the herd book if thought desirable.

An argument may be advanced that this would make a lengthy pedigree, but all that is necessary to be placed on them will be the dam with record, sire and sire's dam with record. Any further history of the individual could be found in the herd book.

Canada is admitted to be one of the best and healthiest breeding grounds for live stock known to the civilized world, and with these natural advantages we should spare no pains to bring our stock to the highest point of excellence and develop a reputation that can be excelled by no other country.

Mr. BALLANTYNE moved, seconded by Mr. McCORMICK, that a vote of thanks be tendered to Mr. Brown for his paper. Carried.

Moved by Mr. ALFRED BROWN, seconded by Mr. JOS. YUILL, that in the opinion of this Association, owing to the importance of the dairy industry of Canada, it is desirable that every effort on the part of this and kindred associations should be to extend their usefulness in every possible way; therefore, be it resolved that a reliable milk record of all registered cows be placed in each future volume of the Dominion Ayrshire Herd Book.

Mr. McCORMICK: I agree with some part of Mr. Brown's paper and others I do not. No doubt the male has a great effect upon the dairy and men ought to be particular in the selection of their males. Very often you will see a person go to a show, and an animal there is a prize winner and he wants it. That is the animal. The money is given, notwithstanding he is not the milker. I have frequently seen that as the case; the form is there, but the milk form is not there. Then, in the matter of private records which have been kept, I find records of that kind scarcely ever come out the same in public that they do in private. Even if you import stock, you are apt to import a certain fancy without importing the real profit. The same thing exists in this country. Certain fancy prize animals have their certain prizes; for instance, we had a prize animal in the west a long time owned by Mr. Jardine. He was a handsome bull, but a first class cow I have never seen from him. He had a daughter which was a prize winner wherever shown. At one time, in Hamilton, I looked at her and said, "I do not want that cow." I had her last winter and she would not produce enough milk for my small family. I do not want her. So, in cases of this kind, we have got to keep our eyes open, because some are determined to sell all they breed whether they are profitable or not.

Mr. YUILL: As seconder of that resolution there is a great deal of truth in what Mr. McCormick says—a great deal too much truth. I think it is a drawback to our Ayrshire cattle that the fancy ones get the prize, and they are not what we want as a dairy cow. Whether this resolution is practicable or not it is for you to say, but if so I think it would be an advantage, providing it can be made practicable. That is a thing I do not know; you know better than I do. I think something in that direction, if we can put it into practice and make it so it will be reliable, is necessary, but unless practicable we are better without. It is not to satisfy us who are here that we want to keep a record, it is to satisfy people who are buying, and we find a great many people who are going into Ayrshire cattle who do not know what they should be. A record of that kind would be a great deal of use.

Mr. BROWN: As far as its being practical is concerned, I think it need not be lengthy. I suggested some different means in my paper in connection with the pedigree, but I do not think that would be practicable or reliable, because pedigrees would have to be returned to the Secretary to insert them upon the milk record; a separate list need not be, as my friend intimated, very lengthy—a very few pages in the Herd Book. One animal need only take up one line. Just give the cow's name and milk record in connection with it, and then it could be referred to at any time after her progeny was registered, at a certain time and age.

The SECRETARY: Do you mean only as to the quantity of milk?

Mr. BROWN: I do not think the quantity of milk would be reliable only. I think it should be the quality as well—the quantity and quality would tell. Then we need not be an expert, we can trace the genealogy through both sides of the animal we wanted to

buy. So the first calf and the pedigree would show the age of the animal. People could judge by the age what they could be expected to do.

Secretary WADE: Do you mean to say you would test the cow after her first calf?

Mr. BROWN: Yes.

Mr. MCCORMICK: I will tell you. I have seen heifers that were extraordinarily good the first year and others were not near as good, but yet the one that was not good the first year came out the better cow. And there is another thing in testing. We have a cow called Primrose 4th, and we tested her and she stood sixty and a half per cent. of cream on the glass, some time after that we tested upon the glass again and I was told Primrose had only six and a half per cent. of cream. I said that was impossible. But that is all it was—sure enough there it was. A few days after it was up to eleven, and came back to what it was originally again. And I enquired of another dairyman—Mr. Drummond, of Montreal—and he said he found the same thing. You may test a cow when she is in one of these conditions and you test her wrong, and perhaps that may not occur again for years. But I find that is exactly the case, and I find by conversing with other people that that has been found repeatedly in dairies where cows have been looked after.

Mr. YUILL: You consider that glass test no good at all?

Mr. MCCORMICK: It does a certain amount of good. At the time Prof. Brown tested the dairy at the Provincial Show in London, that was the test that was on the glass. Of course it gives the amount of cream. The question is, is there the same amount of butter-fat in that cream as in other cows?

Mr. STEWART: I think the only reliable way of testing the quality of milk is by the Babcock tester, and you will find in the very same individual day after day two or three pounds of difference. Now, we send out milk to the creameries. It is conducted by the Experimental Farm, and the very same cows, day after day and on the very same food, there will be a few pounds of difference, do as you have a mind to. The only way you can test the cream is by the tester, and according to the quantity and quality of the milk. If you are not feeding your cow up to her capacity you will not get the full percentage of butter fat in the milk. It has to be drawn from the system, but if you feed her up to her capacity then your milk will stand to that point, and above that point you may increase the quantity of the milk but you cannot increase the quality. I think there cannot be too much stress laid on looking after our dairy cows. It is not only in breeding animals but handling them after they are born. You have got to commence before they are born; you have got to carry it on through until you are done with them as a milker. If you encourage them as beef when they are small they are inclined to beef. If you raise them to milk they will develop into milkers, and it lies a good deal in your hands the same as a machine; the machine may be as good as it can be but if you do not handle it properly it will not work right.

The SECRETARY: I might say the expense of a matter of this sort would not be large, but I would not think of a test by people sending to us private records. I think the only way you can get a test which would be really reliable would be to send a man around to the different herds, if money could be raised for that purpose, for a test should be the same for every cow recorded in the book. Otherwise it would not be at all a true test. Making a record of tests will be working in the right direction; in printing it, it would not be more than a couple of lines.

Mr. BROWN: The importance must not be overlooked that we are at the mercy of poor breeders or poor feeders. They get hold of a lot of evil cattle and will not feed them, and the consequence is those people are hurting the reputation of one of the best breeds that are known to the world. That was my conviction in preparing this paper, and the convenience it would offer to breeders themselves in selecting animals; and if you wish an infusion of new blood in your herd by way of a sire it would pay to give even ten times what we are paying to-day if you get the value for the investment.

Mr. YUILL: I would say to leave that as a notice of motion to be brought up next year. Let it be discussed and thought over and some means may be taken to bring it to something. Carried.

POINTS OF A DAIRY COW.

Mr. YUILL being called upon said: I was asked by the Secretary to prepare a paper for this meeting, but as I was from home for a long time and when I returned I found I had not time or had not the inclination to write one.

I might say that there were no prizes offered last year for milk tests where all breeds could compete. There were several prizes offered for the different breeds, but there was not a prize offered in Ontario, so far as I am aware of, where all breeds could compete; there was one in the Province of Quebec in the eastern townships at Sherbrooke, and that one was taken by Ayrshires. There were several breeds competed for it. Last year there were a great many tests open to all breeds, and the Ayrshires took every one of them except one—the second prize, which was taken by Jerseys. Last year there was only the one prize offered as far as I am aware of and the Ayrshires took that. I think I will take up your time a few minutes by pointing out the points of a dairy cow, no matter what the breed is. We require a number of points in any cow to make a good dairy cow, and I will use this picture to illustrate what I intend to say.

We will take the face first. Now, the face of a dairy cow is a very important part, something like a young girl's. If a girl has a pretty face it carries her through. You get a dairy cow with an intelligent countenance and it is a great help. The face should be lengthy but not so long as to amount to a deformity. The eyes should be wide apart, prominent, bright. The eyes show the nerve of the cow. The dairy cow should have nerve enough so that when you go around her the first look she gives you seems to mean, "I think I am as good as you are." When we talk of a nervous cow we do not mean a kicking cow; we mean a cow with a strong nerve. The forehead should be well curved between the eyes and the horn. There should be very little flesh about the face and none in front of the eyes. There is no need of much flesh about a cow's head.

Mr. BALLANTYNE: Why would you prefer a long faced cow to a short faced one?

Mr. YUILL: The short face and short neck and short tail go together. If I had to take either one of them I would prefer the long face, but you want to get between that.

Mr. BALLANTYNE: Would it have any effect on the feeding qualities?

Mr. YUILL: No. The horn is only a matter of taste; that is, the shape of the horn but not its size. We want a good, healthy horn. The fancy shape for Ayrshire is up and out, although there are a great many want the old turn-in horn. The Holstein wants to go forward, down a little and in a little. I want a medium, strong horn, but not enough to make it appear coarse. A strong horn denotes a strong constitution. The neck should be long and tapering and a little inclined lower than the back. It should be quite small at the head and thin. I would rather have a thin deep neck than a round neck. The shoulders should be thin, that is, they should come to an edge upon the top; the back should be straight. We hear a great many people finding fault with a cow because it was hollow backed. The old cow is apt to get hollow backed through time, but I would not want a young one to be hollow backed. The wither should be well hung and should have no hollow behind the shoulder. The ribs should be well sprung and the last three ribs inclined back instead of going down the body, and the ribs should be far apart, so that you feel as if you could put your fingers between them. The joints on the back bone should be the same, the cavity in the shoulder the same. She should be rather long in the kidney. Remember it is not a Clyde horse you are looking after. And she should be long in the quarter. The tail should be set on rather high up on the back and it should be fine. I do not think the tail has anything to do with the production of milk, but you will generally find a short thick tail does not go with milk producing qualities.

Mr. STEWART: That no one should be led astray as to the tail being set high, you do not mean it should be set up.

Mr. YUILL: No; the tail should not set up, it should set a little up on the back bone. The tail should not hang clear of the animal, it should rest close.

Mr. STEWART: What is the advantage of having the tail close?

Mr. YUILL: The reverse goes with the beef producing animal. The tail should be rather tapering, it should be strong at the head, it wants to be long and tapering. Now, we come to the most important part of the dairy cow, that is the udder. The udder should cover as much of the body as possible, it should go up well behind and well forward. There is a mark in every cow, or almost every cow. The udder is marked as if it were intended to be divided into quarters. You cannot divide it into quarters but you can in half. It is marked as if it were intended to be divided. These quarters should be as evenly divided as possible. The udder should be not only well up behind and well forward, but it should be thick through, and the cow should be made so that there is plenty of room for an udder; that is, the thighs ought to be thin and wide between so as to leave lots of room. There is no very great need for a cow's udder hanging down very low and yet we find often in an old cow that the udder hangs low. When the udder is milked out so it should almost disappear, that is, the part behind would hang in folds, one overlapping the other. The hair on the udder should not be very strong, but soft and woolly. There is one part of the cow we might mention, and that is what is called the escutcheon. That is the part of the cow on which the hair goes the wrong way. That should be well defined, and there are three kinds, namely, the long, the short and the heart shaped, which just reaches half way or divides the other two. The first denotes the cow will give a small flow for a long time, while the short shows the cow that will give a great flow of milk for a short time and go dry for a long time, so the heart shape just divides the thing I do not know whether there is anything in the escutcheon of the cow. Then we come to the cow's teats. The cow's front teats should be three inches long and the hind ones two and a half. The hind teats should be two-thirds as far apart as the front ones. We do not want a bag that the bag and teat is all in one. The teat should be as large at one end as the other, it ought not to taper to a point. If any of you have cows tough to milk you do not need to beef the cow because of that. You can make a cow easy to milk if you want to. After you have milked just put in a little wooden pin made very smooth and very small, to begin with, a little larger than the stream that comes out of the teat. Put that in the teat until you want to milk again and continue for a time, and in that way you can make a cow as easy to milk as possible. The cow does not feel annoyed at it. It should be about three-quarters of an inch long. Then if she is too easily milked, just have a little basin of alum water and when you are done milking dip the teat in the alum water. The shank should be thin, though still strong enough to carry the cow, but should be flat and the joints well knit together. The flanks should also come well down so when you look at the cow she should have a wedge shaped appearance every way you look at her. Then there is a nerve line that goes down that supplies nerve to the udder and which should be well developed. That is a very important part, that nerve line in the cow. Now, we will go to the milk vein. It should cover as much of the body as possible, and go into the body as far forward as possible, and it should be as large as possible. It cannot be too large, but if you get a large vein and small hole where it goes into the body, and you examine it, you will find the vein has divided. You may get a cow well developed on one side and not on the other. You must examine both sides of the cow if you want to be sure of a milch cow. Then there is no need of a heavy brisket in a milch cow, but she wants to be wide between the front legs so as to give plenty of room for the heart and lungs. She does not want to have very long legs in the front; they want to be the same as the hind, not too long and a little flat shaped. She does not require any dew-lap, and the less the better, unless you want a little more hide to sell. The head should be long, and the shoulder wants to merge into the neck so that you hardly know where the division is, the neck well arched below, with a moderately fine jaw. The muzzle should be large. However, a cow may have all these good points, but if she has a small mouth she is a small feeder, and therefore cannot produce the milk, while the breathing apparatus is small if she has small nostrils. Try always and have a good large mouth and large nostrils in the cow. The hair should be soft. The skin should not be too thin, yet there is more danger of it being too thick But no matter whether it is thick or thin it should not be hard, it ought to have a pliable feeling and a feeling as if it was made for a larger cow. I might say the ear should be a little large but thin, and the inside of the ear yellow. I do not know

whether there is anything in it or no, but an idea is general that the color of the inside of the ear indicates to a considerable extent the quality of the milk. I might say this further that while we have several dairy breeds in Ontario, I am perfectly satisfied that the Ayrshire has more of these good points I have above indicated than any of the other breeds.

Mr. McCormick: I must say that two to two and a half inches is the length given for the teats in Scotland. The Americans put it at from two to three inches. The neck, as I understand Mr. Yuill, should lower a little. I do not agree with that, for I want the neck level with the back bone. Of course the skin often depends a good deal upon feeding. If you feed an animal for prize designs you are apt to have a very heavy skin; and if you have one that has run around and is not highly fed, you will find there is not a finer skin, even if they are of the same breeding. That is my experience.

Mr. Morton, of Hamilton: I has given me great pleasure to be present to-day, and I have listened to the remarks with a great deal of interest. I am, comparatively speaking, a novice in this business, having only commenced quite recently, and I am here to get information. The remarks made by those who have long been in the business has been profitable to me, and I hope I will be able to benefit by them. Mr. Yuill's remarks in relation to the determination of an Ayrshire cow has been interesting, although I find in my herd that there are individual members of it that do not quite come up to his standard, and yet I find them to be capital animals; so you can scarcely form a correct idea of what a cow will do merely from these outlines. The best milker I have had was not a cow I would have bought. She is a capital milker, but she does not come up to Mr. Yuill's standard by any means, in the neck and shoulder or in the tail. I would like to ask a question of Mr. Yuill or Mr. McCormick. Have you been troubled in your herds with any of your cattle having died on account of contraction of the womb after calving?

Mr. Yuill: I never had a case of it.

Dr. Mole: Dr. Darwin, when he first went into the study of breeding, made a very wise remark with regard to the female, that as soon as she comes to a state of perfection then she always goes back to her original type. When she has been brought to the standard, then she goes back to the original point. And in this case I think it has been something of that character.

Mr. Knight: I started with two or three Ayrshires, and one in particular had medium large teats which satisfied me, and I never kept any heifers except from this one. My whole stock was bred from this one cow, and mine all have teats plenty large enough for anyone.

Mr. Yuill: Did you find they were any better milkers?

Mr. Knight: They were best milkers with the large teats.

Mr. McCormick: What length do you mean—about two inches?

Mr. Knight: About two and a half to two and three-quarters.

Mr. Ballantyne: I have heard what has been said about this case of the cow dying, but what the cause of that was I would not like to say. I suppose it was in this way: The previous year probably a wound had been caused in opening the womb and following up that the head closed up a little too much. I had it in sheep; I never had a cow in that position. I remember once in the Old Country,—but I was very young then,—there was a cow of that kind. There was a gentleman called in who understood something about veterinary work, and he said to put two fingers in, press with the fingers more and more until the cow can deliver the calf. I have seen two or three in this country in that position. You could see what you could fancy was a wound there, and in healing up it contracted and it would not give. That is all I could say about it.

Mr. Yuill: Mr. Knight was speaking about cows coming in in the fall. My cows come in in the fall and I raise every calf. Last year we milked twenty-two cows and fed twenty-four. We fed twenty-four calves off of the twenty-two cows, and supplied family use—a family of nine and two hired men—and sold $46 worth of butter from

each cow after all. We find that is the best time of the year to have our cows coming in. We have the calves a good size then to sell the next fall at the exhibitions. I would prefer that November should be about the time you commence stabling; for heifers I would like to have them stabled. As a rule we do not feed any new milk after the milk is fit to use, and we can raise very good calves—perhaps quite as good as if they sucked the cow. I believe we get more milk from a cow having them come in in the fall than in the spring.

Election of Officers.

The election of officers then took place, with the following result:

President: W. Stewart, jr., Menie, Ont.

Vice-President for Ontario: W. W. Ballantyne, Stratford, Ont.

" *Quebec*: W. C. Edwards, M.P., North Nation Mills.

" *Manitoba*: George Steele, Glenboro', Man.

" *North-west Territories*: Claude H. Manners, Moosomin, N.W.T.

" *British Columbia*: W. Wells, Chilliwack, B.C.

" *Nova Scotia*: Thos. Blanchard, Truro, N.S.

" *Prince Edward Island*: C. C. Gardiner, Charlottetown, P.E.I.

Directors: J. McCormick, Rockton; Joseph Yuill, Carleton Place; M. Ballantyne, St. Marys; Thos. Guy, Oshawa; A. Kain, Byron; John Crosby, Campbellford, D. Morton, Hamilton.

Auditors: H. E. Eyre, Harlem, and G. D. W. Green, Toronto.

Delegates to Toronto Industrial Exhibition: J. McCormick and Wm. Stewart.

Delegates to Western Fair, London: M. Ballantyne and A. Kains, Byron.

Delegates to Ottawa Exhibition: Joseph Yuill and C. Smith.

Delegates to Cattle Breeders' Association: J. McCormick and D. Morton.

Judges: M. Ballantyne, St. Marys; William Crawford, Brown's Corners; J. M. Jones, Bowmanville; Campbell Smith, Huntonberg; H. G. Clark, Brampton; D. Nicol, Cataraqui; A. Kains, Byron; J. McCormick, Rockton; Joseph Yuill, Carleton Place; H. E. Eyre, Harlem; R. Robertson, Howick; William Hunter, Lancaster.

Mr. M. Ballantyne, the new President, said: I must render you thanks for putting me in this honorable position, and I will say in introduction that I must congratulate you upon the prosperous year that has passed regarding the prosperity of the breed we so much love and are interested in. The breed itself is beginning to become the favorite, not only throughout the length and breadth of this country, but I may say all over the world. Dairying has become one of the live industries of this fair Canada of ours. The cheese industry alone yields us a revenue of twelve million dollars a year, and you will agree with me that the Ayrshire cattle have made a good part of that. It is only yet in its infancy; it has been growing year after year, and it will grow yet. Canada is beginning to be something in the world. By the amount of cheese and other products we send there, people in the Old Country are beginning to wonder what place this Canada is. We may be gratified by the year that has passed, and I want you to look out for the year that has begun. We have now got to be up and doing. Before this time next year you will hear something about Canada and probably of its dairy products too. We will have to be alive and not lean on what any man will do, let every man take hold and send products and cattle to Chicago and make a good appearance. It is not what it is going to cost you or cost me, let us set that aside and see what we are going to do. Let us be united, and with one mind decide that Canada will tell something to the world before another year. We have got material within our hands now—you have got material as it were to fetch the profit. We are in a fruitful coun-

try, in which we can raise cattle and breed them and feed them, too ; and let us be united in going forth in this industry before us. We have much to contend with ; we have the United States on one side—a wide and broad country—but don't be afraid of them. They have got to come to Canada for the best ; and I believe if they could they would like to come back and beat us. (Applause.)

The meeting then adjourned.

SEVENTH ANNUAL STALLION HORSE SHOW.

The following is the result of the Seventh Annual Stallion Horse Show, held at the Drill Shed, Toronto, on March 8th and 9th, 1893, under the management of the Agriculture and Arts Association, the Clydesdale Horse, Shire Horse and Hackney Horse Associations.

The Seventh Provincial Spring Stallion Show for different breeds was held in the Drill Shed, City of Toronto, on March 8th and 9th, 1893. Horses were inspected and entries made for World's Columbian Exhibition, and premiums were offered for Thoroughbreds, Coach or Carriage, Standard Bred Roadsters, Hackneys, Suffolk Punch, Shire and Clydesdale Entire Horses. A committee of management from Agriculture and Arts Association, together with representatives from the Clydesdale Association, the Hackney Horse Society and the Shire Horse Association conducted the Show.

LIST OF PRIZES AWARDED.

THOROUGHBRED.

Stallions, Foaled Previous to January 1st, 1890.

1st prize, $50 ; 2nd, $35 ; 3rd, $25 ; 4th, $15 ; 5th, highly commended ; 6th, commended.

Judge.—R. Pringle, Toronto.

1. W. H. Millman, Woodstock, Ont., Dandie Dinmont (imp.), 452 ; brown, stripe on face ; foaled May, 1882. Bred by Prince Soltykoff, Newmarket, Eng. ; imported in 1882 by exhibitor ; sire, Silvio ; dam, Meg Merrilies, by Macgregor, etc.
2. S. B. Fuller, Woodstock, Ont., Wyndham ; sire, Warwick ; dam, Lorilla, by Mortimer (imp.), etc.
3. Quin & Carter, Brampton, Ont., Wiley Buckles (Vol. 5, Bruce's) ; bay, four white feet ; foaled in 1885. Bred by Wiley Buckles, Champaign, Ill., U.S. ; sire, London (imp.) ; dam, Lizzie Vic, by Uncle Vic, etc.
4. S. B. Fuller, Woodstock, Ont., Goldfellow ; dark bay ; sire, Longfellow ; dam, Goldring, by Ringold, etc.
5. Peter Small, Toronto, Ont., Hercules ; chestnut ; foaled in 1885. Bred by Pierre Lorrilard, Jobstown, N. J., U. S. ; sire, Mortimer ; dam, Ontario, by Bonnie Scotland (imp.), etc.
6. J. W. Murray, Toronto, Ont., June Day ; brown ; small star on face ; foaled in 1887. Bred by A. J. Alexander, Woodburn Station, Ky., U. S. ; sire, Falsetto ; dam, Virga, by Virgil, etc.

Stallions, Foaled Subsequent to January 1st, 1890

1st prize, $40 ; 2nd, $30 ; 3rd, $20 ; 4th, $10 ; 5th, highly commended ; 6th, commended.

1. Thos. Irving, Winchester, Ont., Ironside (Vol. XVII.); bay ; foaled in 1890. Imported in 1892 by exhibitor ; sire, The Falcon ; dam, Lily, by Cambuslong, etc.
2. Thos. Graham, Owen Sound, Ont., Dictator ; sire, Shellingstone ; dam, Georgia.

Sweepstakes, by the Toronto Electoral District Agricultural Society for the Best Thoroughbred Stallion of Any Age, Qualified to Improve the Breed of Saddle Horses and Hunters.

Quin & Carter, Brampton, Ont. Wiley Buckles (Vol. 5 Bruce's), as above.

CARRIAGE OR COACH.

Stallions, Foaled Previous to January 1st, 1890.

1st prize, $50; 2nd, $35; 3rd, $25; 4th, $15; 5th, highly commended; 6th, commended.

Judge.—W. H. Gibson, Buffalo, N. Y., U. S.

1. Thos. Irving, Winchester, Ont., Prince Arthur (imp.), 1852; bay; foaled in 1889. Bred by Henry Watson, Bampton, York, England; sire, Prince Victor, 376; dam, Countess of Wilton, 26, by Fedius Dius, 1592, etc.
2. A. C. McMillan, Erin, Ont., Shining Light, 1178; foaled June 10th, 1885. Bred by Luke Dale, Atterington, Eng.; sire, Wonderful Boy, 534; dam, by Herod, 218, etc.
3. Lowes Bros., Brampton, Ont., Stanton King; dark bay, black points; sire, General Stanton, 2545; dam, Keefer Mare, by Kentucky Hunter, etc.
4. C. J. Hughson, Orono, Ont., Sir Roger Tichborne, 467; chestnut, star on forehead; foaled in 1886. Bred by exhibitor; sire, Cheneau (imp.), 3838; dam, Jennie Clarke, 466, by Cologram, etc.
5. Thos. Oliver, Brantford, Ont., Crown Prince; bay, black points; foaled May 15th, 1889. Bred by exhibitor; sire, Renforth; dam, mare by Clear Grit, etc.
6. Dunn & Beckett, Hamilton, Ont., Invador, 725, brown, small star on forehead; foaled April 28th, 1887. Bred by M. Vallent, Marchemaisons, Arne, France; sire, Etudiant; dam, N., by Parthenon, etc.

Stallions, Foaled Subsequent to January 1st, 1890.

1st prize, $40; 2nd, $30; 3rd, $20; 4th, $10; 5th, highly commended; 6th, commended.

1. Mathew Howson, Ashgrove, Ont., Peacock; bay, black points; foaled May 2nd, 1890. Bred by exhibitor; sire, Shining Light, 1178; dam, Maud, by Peacock (imp.), etc.
2. W. C. Brown, Meadowvale, Ont., Prince Victor; bay, black points; foaled May 2nd, 1890. Bred by P. D. Stotts, Markham, Ont.; sire, Prince Alexander, 903; dam, Joan, by Rainbow Coachman, etc.
3. Peter McDermaid, Pickering, Ont., Top Gallant 2nd; bay, black legs; foaled June 28th, 1890. Bred by exhibitor; sire, Top Gallant (imp.); dam, mare by Deal's Hambletonian, etc.

Sweepstakes, for Best Coach Stallion of Any Age.

$20.

1. Thos. Irving, Winchester, Ont., Prince Arthur (imp.), 1852; bay; foaled in 1889. Bred by Henry Watson, Bampton, York, England; sire, Prince Victor, 376; dam, Countess of Wilton, 26, by Fedius Dius, 1592, etc.

STANDARD BRED ROADSTER.

Stallions, Foaled Previous to January 1st, 1890.

1st prize, $30; 2nd $25; 3rd, $15; 4th, $10; 5th, highly commended; 6th, commended.

Judge.—W. W. Willoughby, M.D., Colborne, Ont.

1. John McIntyre, Komoka, Ont., Prosteus, 10741; bay; foaled in 1887. Bred by Nat Brown, Burlington Ia., U. S.; sire, Balaklava, 1853; dam, Phallas Maid, by Phallas, 1146, etc.
2. Kidd Bros., Lucknow, Ont., Oliver Wilkes, 19647; bay, off hind foot white; foaled June, 1886. Bred by C. F. Emery, Cleveland, Ohio, U. S.; sire, Brown Wilkes, 2040; dam, Bessie Turner, by Virginius, etc.
3. Robt. Porteous, Simcoe, Ont., The Wasser, 7753; bay, foaled in 1884. Bred by Col. E. W. Conner, Redbank, N. J., U. S.; sire, Gen. Washington, 1161; dam, Kate Taylor, by Aberdeen, 27, etc.
4. James Baptie, Springville, Ont., Almonte Champion, 5522; dark bay, star on face; foaled in 1884. Bred by General Withers, Lexington, Ky., U. S.; sire, Almonte, 33; dam, Stella Champion, by Mambrino Champion, 3130, etc.
5. W. H. Millman, Woodstock, Ont., Sunny Alta, 20417; bay, small star, blaze, legs; foaled in 1887. Bred by Leland Stanford, Palo Alto, Cal., U. S.; sire, Liberty Simbad, 20079; dam, Gazelle, by Primus, 275, etc.
6. The Cedars Breeding Stables, Eglington, Ont., Oliver W., 4135; brown; foaled in 1886. Bred by J. S. Wagner; Roundhouse Stock Farm, Washington, Ia., U. S.; sire, Wagner's Eastview, 2304; dam, Miss Cunningham, by Eastview, 60, etc.

Stallions, Foaled Subsequent to January 1st, 1890.

1st prize, $30; 2nd, $20; 3rd, $10; 4th, $5; 5th, highly commended; 6th, commended.

1. Benj. Martin, Binbrook, Ont., Binbrook, 13561; bay, hind feet white; foaled in 1890. Sire, Superior, 3780; dam, Bonanza Maid, by Highland Boy, 1320, etc.
2. The Cedars Breeding Stables, Eglington, Ont., Judge Mumford, 13659; chestnut; foaled in 1890. Bred at the Homestead Stock Farm, Clarksville, Tenn., U. S.; sire, Sir Benton, 8008; dam, Annapolis Girl, by Young Sentinel, 660, etc.

SWEEPSTAKES, FOR BEST ROADSTER STALLION, ANY AGE, GIVEN BY THE AGRICULTURE AND ARTS ASSOCIATION.

$20.

Kidd Bros., Listowel, Ont., Oliver Wilkes, 10647.

HACKNEY.

STALLIONS, FOALED PREVIOUS TO JANUARY 1ST, 1890.

1st prize, $50; 2nd, $35; 3rd, $25; 4th, $15; 5th, $10; 6th, highly commended; 7th, commended.

Judge.—Arch. Wilson, Paris Station, Ont.

1. R. Beith & Co., Bowmanville, Jubilee Chief (imp.) —1— (2122); dark brown, four white feet; foaled in 1887. Bred by Wm. Martin, Scoreby, Grange Gate, Helmsley, York, Eng., imported February, 1890, by Robt. Kerr, Reaburn, Man.; sire, Pilot (1323); dam, Queen of the Forest (297), by Fireaway (249).
2. R. Welbourn, Orangeville, Ont., Lightning (imp.) —14— (2540); bay, foaled in 1888. Bred by John Lett, Cleveland Stud Farm, Rillington, York, Eng.; imported by John Donkin, Riverview, Ont.; sire, Thornholme Star (1935); dam, Fantail (1105), by Denmark (177), etc.

STALLIONS, FOALED SUBSEQUENT TO JANUARY 1ST, 1890.

1st prize, $40; 2nd, $30; 3rd, $20; 4th, $10; 5th, highly commended; 6th, commended.

1. R. Beith & Co., Bowmanville, Ottawa (imp.) —2—; chestnut; foaled in 1890. Bred by Wm. Martin, Scoreby Grange, York, Eng.; imported in dam, February, 1890, by Robt. Kerr, Reaburn, Man.; sire, Lord Derwent 2nd (1034); dam, May Flower (imp.) —2— (767); by Highflyer (1648), etc.
2. Irving & Brown, Winchester, Kilnwick Fireaway (imp.) —5— (3698); bay, off hind foot partly white; foaled July 2nd, 1890. Bred by John T. Elgey, Kilnwick, Pocklington, York, Eng.; imported July, 1892, by Thomas Irving, Winchester; sire, Lord Swanland (1834); dam, Trip, by Trip-Away (2296), etc.

SWEEPSTAKES, BEST HACKNEY STALLION, ANY AGE, GIVEN BY THE HACKNEY HORSE SOCIETY.

$20.

R. Beith & Co., Bowmanville, Ont., Ottawa (imp.) —2—.

SUFFOLK PUNCH.

STALLION OF ANY AGE.

1st prize, $25; 2nd, $15; 3rd, $10; 4th, highly commended; 5th, commended.

1. J. H. Storey, Winchester, Ont., Captain Williams, 1993; chestnut; foaled April 4th, 1888. Bred by David Christie, Winchester, Ont.; sire, Checkmate, 1556; dam, Smart, 1476, by Gerrett's Cupbearer, 566, etc

SHIRE.

STALLIONS, FOALED PREVIOUS TO JANUARY 1ST, 1890.

1st prize, $40; 2nd, $30; 3rd, $20; 4th, highly commended; 5th, commended.

Judge.—J. Y. Ormsby, Danville, Que.

1. H. George & Sons, Crampton, Ont., Lennox (imp.) [103] (7574); bay; foaled in 1887. Bred by Hugh Ashcroft, Tarleton, Preston, Lancashire, Eng.; imported in 1889 by exhibitors; sire, Triton (4128); dam, mare by Royalist (2488), etc.
2. Wm. Maltby, Laurel, Ont., Mirfield Merchant (imp.) [236] (7766); bay, ratch on face, nigh fore leg and hind legs white; foaled in 1887. Bred by Wm. Dean, Dousby, Pinchback, Lincoln, Eng.; imported September, 1891, by John Donkin, Riverview, Ont.; sire, Conqueror (3042); dam, mare by Drayman (663).
3. W. J. Shepherdson, Walter's Falls, Ont., King of the Castle (imp.) [71] (3171); brown; foaled in 1882. Bred by Stephen Roberts, Mount Pleasant, Beston, Eng.; imported by J. Gardhouse & Sons, Highfield, Ont.; sire, Honest Tom (1111); dam, Smart, by Honest Tom (3143), etc.
4. Francis Coleman, Hill's Green, Ont., British Lad [247]; bay, stripe on face, four white legs; foaled May 1st, 1889. Bred by exhibitor; sire, Farmer's Glory (imp.) [103] (3082); dam, Depper (imp.) [27], by The Yeoman (2377), etc.
5. John Ireland, Kleinburg, Ont., Sir John Welsh (imp.) [165] (3318); bay; foaled in 1881. Bred by Edward Green, The Bank, Pool Quay, Welshpool, Eng.; imported in 1883, by John Bell, Amber, Ont; sire, Sir John Falstaff (2023); dam, Queen of the Bank, by Meredith's King of the Vale (2839), etc.

STALLIONS, FOALED IN 1890.

1st prize, $30; 2nd, $25; 3rd, $15; 4th, highly commended; 5th, commended.

1. Wm. Mullin, Hillsburg, Ont., Cock Robin (imp. in dam) [245]; chestnut, stripe on face, one white foot, three white legs; foaled April 21st, 1890. Bred by John Whatmough, Ridgeway, Sheffield, Eng.; imported in dam, July, 1889, by Ormsby & Chapman, Springfield-on-the-Credit, Ont.; sire, Game Cock (7252); dam, Leake Polly (imp.) [61], by Monster (2846), etc.

SWEEPSTAKES, BEST SHIRE STALLION, ANY AGE, GIVEN BY THE SHIRE HORSE ASSOCIATION OF CANADA.

$20.

H. George & Sons, Crampton, Ont., Lennox (imp.) [103] (7574).

CLYDESDALE.

STALLIONS, FOALED PREVIOUS TO 1ST JANUARY, 1890.

1st prize, $50; 2nd, $35; 3rd, $25; 4th, $15; 5th, $10; 6th, very highly commended; 7th, highly commended; 8th, commended.

Judge.—Robt. Ness, Howick, Que.

1. D. & O. Sorby, Guelph, Ont., Grandeur (imp.) [1724] (6814); brown, spot on forehead, white hind foot; foaled 1887. Bred by Wm. Hunter, Garthland Mains, Stranraer, Scotland; sire, Darnley (222); dam, Trim of Garthland (4639), by Farmer (280), etc.
2. Graham Bros., Claremont, Ont., Queen's Own (imp.) (1708) (7170); dark bay, stripe on face, nigh hind foot white, tip on off fore foot; foaled May, 1886. Bred by Wm. Craig, Barbley, Maryhill, Scotland; imported, 1891, by exhibitors; sire, Prince of Wales (673); dam, Barbley Kate (1142), by Paisley Jock (781), etc.
3. Robt. Davies, Todmorden, Ont., Energy (imp.) (1432) (7691); bay, stripe on face, hind legs white; foaled July 1st, 1888. Bred by Wm. Hood, Chapelton, Borgue, Kirkcudbright, Scotland; imported in August, 1889, by exhibitor; sire, Macgregor (1487); dam, Rosie (543), by Pride of Kilbride (660), etc.
4. R. Beith & Co., Bowmanville, Ont., Sir Walter (imp.) (1131) (8272); light brown, one fore foot and one hind foot white, stripe on face; foaled June 1st, 1886; imported 1889, by exhibitors. Bred by James Crawford, Boreland, Castle Douglas, Scotland; sire, Bold Maghie (4259); dam, Jean of Boreland, by *Zulu*, etc.
5. Graham Bros., Claremont, Ont., Lord Harcourt (imp.) (1430) (7960); brown, stripe on face, near fore and off hind feet white; foaled May 27th, 1887. Bred by James Spark, Cantlyhills, Stonehaven, Scotland; imported August, 1890, by exhibitors; sire, Pride of the Clans (4632); dam, Jewel of Cantlyhills (6705), by Prince Charlie (629), etc.
6. John L. Patterson, Millbrook, Ont., Laird o' Logie (imp.) (447) (3755); bay, white mark on face, four white feet; foaled April, 1885. Bred by Robert Thorn, Pitbeshie, Strathmiglo, Scotland; imported in 1885, by David Annan, Pickering, Ont.; sire, Young Baronet (919); dam, Sally of Pitbeshie (4180), by Champion (31), etc.
7. Graham Bros., Claremont, Ont., Othello (imp.) (1570) (8093); light bay, white face, far hind leg dark, other three legs white; foaled May, 1887. Bred by Robert Neil, Barnbeard, Castle Douglas, Scotland; imported in 1889, by John Gilkinson, Orangeville, Ont.; sire, Bold Maghie (4259); dam, Polly of Barnbeard (6562), by Carswell (1429), etc.
8. M. Meagher, Todmorden, Ont., Rose Hill (imp.) (1334) (7206); bay, white face, three white feet; foaled June 25th, 1887. Bred by W. & J. Weir, Rose Hill, Larbert, Stirling, Scotland; imported August, 1889, to Toronto, by John Ralston, Westfield, Croy, Scotland; sire, Earl Grange (4350); dam, Maggie of Rose Hill (7057), by Cawdor III. (2054), etc.

STALLIONS, FOALED IN 1890.

1st prize, $40; 2nd, $30; 3rd, $20; 4th, $10; 5th, $5; 6th, very highly commended; 7th, highly commended; 8th, commended.

1. Wm. Innes, Bradford, Ont., Symmetry (imp.) (1715) (9413); light bay, stripe on face, three white feet; foaled April 8th, 1890. Bred by W. McAdam, Whitepark, Castle Douglas, Scotland; imported 1891, by exhibitor; sire, Ensign (6749); dam, Lady Fleet (3385), by Pride of Blacon (2332), etc.
2. R. D. Dowdes, Springville, Ont., McLaws (1940); dark bay stripe on face, little white on feet; foaled May 30th, 1890. Bred by exhibitor; sire, General Wolfe (imp.) (844) (880); dam, Forest Queen (imp.) (657), by Sir Hildebrand (402), etc.
3. John Davidson, Ashburn, Ont., Bargownie (imp.) (9023) (9115); brown, white on face, hind feet white; foaled May 8th, 1890. Bred by Andrew Crilkshank, Stayton, Summerhill, Scotland; imported August, 1891, by Davidson & Sorby, Ashburn and Guelph; sire, Gallant Mc(Lennon (6709); dam, Autumn Bud (7135), by Lord Erskine (1744), etc.
4. John Vipond, Brooklin, Erskine's Last (9015); brown, patch on face, hind feet white; foaled May 10th, 1890. Bred by exhibitor; sire, Erskine (imp.) (1662) (4080); dam, Heather Bloom (imp.) [2003], by Farmer's Boy (2097), etc.

5. John Davidson, Ashburn, Ont., Westfield Stamp (imp.), [1819] (9467); light bay, stripe on face, hind feet white; foaled May 10th, 1890. Bred by James Watt, Westfield, Elgin, Scotland; imported August, 1891, by Davidson & Sorby, Ashburn, Ont.; sire, Cairnbrogie Stamp (4272); dam, Luck (11146), by Johnny (414), etc.
6. Geo. Pepper, Toronto, Ont., Daisy's Macclaskie [1847]; bay; foaled April 30th, 1890. Bred by Wm. Davies, Markham, Ont.; sire, Macclaskie (imp.) [810] (6996); dam, Daisy (imp.) [149], by Young Lord Lyon (994), etc.
7. Geo. Gray, Clarke, Gladstone [2028]; bay, white face, hind feet white; foaled May 11th, 1890. Bred by exhibitor; sire, Candlemas (imp.) [815] (5614); dam, Maid of Renfrew (imp.) [487] (7290), by Baron Renfrew (37), etc.
8. Jos. H. Millard, Altona, Ont., Macclaskie's Heir [2026]; bay, stripe on face, four white feet; foaled June 17th, 1890. Bred by exhibitor; sire, Macclaskie (imp.) [810] (6996); dam, Blossom (imp. in dam) [361], by Lord Lyon (489), etc.

STALLIONS, FOALED SUBSEQUENT TO JANUARY 1ST, 1891.

1st prize, $30; 2nd, $20; 3rd, $15; 4th, $10; 5th, very highly commended; 6th, highly commended; 7th, commended.

1. Alex. Cameron, Ashburn, Ont., Royal Stamp [1950]; bay, white face, four white feet; foaled June 9th 1891. Bred by exhibitor; sire, Tannahill (imp.) [1205] (4745); dam, Mary's Pet (imp.) [1643], by Cairnbrogie Stamp (4274), etc.
2. Wm. Philp, Yelverton, Ont., Sir Burnie Dale [2009]; bay, white face, hind legs white; foaled May 28th 1891. Bred by exhibitor; sire, Erskine's Pride (imp.) [1332] (4989); dam, Campbeltown Maid (imp.) [1946], by Jacob Wilson (2178), etc.
3. J. & J. A. Boag, Queensville, Ont., Blooming Heather [1983]; brown, ratch on face; foaled April 22nd, 1891. Bred by exhibitors; sire, Macneilage (imp.) [1117] (2992); dam, Brown Peggy [1079], by Scotsman (imp.) [166] 154, etc.
4. Jos. H. Millard, Altona, Ont., Merry Monarch [2027]; dark bay, stripe on face, hind feet white; foaled September 11th, 1891. Bred by exhibitor; sire, Macneilage (imp.) [1117] (2992); dam, Blossom (imp. in dam) [361], by Lord Lyon (489), etc.

SWEEPSTAKES, BEST CLYDESDALE STALLION, ANY AGE, GIVEN BY THE AGRICULTURE AND ARTS ASSOCIATION.

Prince of Wales prize, $50.

1. D. & O. Sorby, Guelph, Ont., Grandeur (imp.) [1724] (6814); brown, spot on forehead, white hind foot; foaled 1887. Bred by Wm. Hunter, Garthland Mains, Stranraer, Scotland; sire, Darnley (222); dam, Trim of Garthland (4699), by Farmer (286), etc.

CANADIAN BRED CLYDESDALE.

STALLIONS, FOALED PREVIOUS TO JANUARY 1ST, 1890.

1st prize, $30; 2nd, $20; 3rd, $10; 4th, $5; 5th, very highly commended; 6th highly commended; 7th, commended.

Judge.—Robert Ness, Howick, Que.

1. P. Kelly, Jr., Brechin, Ont., Pride of Dollar [962]; bay, stripe on face, nigh hind foot white; foaled May 6th, 1887. Bred by Wm. Cox, Thornhill, Ont.; sire, Pride of Perth (imp.) [282] 2264 (2336); dam, Sally of Thornhill [328], by Sir Wm. Wallace (imp.) [123], 1, etc.
2. Anthony Ionson, Wexford, Ont., Tom of Wexford [1699]; chestnut, stripe on face, fore feet white, hind legs white; foaled May 27th, 1889. Bred by exhibitor; sire Pride of Corsock (imp.) [1698] (6154); dam, Jess of Wexford [1638], by Joe the Banker (imp.) [125], 75, etc.
3. John & James A. Boag, Queensville, Ont., Ben Bolt [1326]; bay, white face, four white feet; foaled May, 1886. Bred by Edward Atkinson, Brougham, Ont.; sire Benmore (imp.) [315] (1948); dam, Sally [1199], by Clansman (imp.) [265] 185, etc.
4. Wm. Martin, Ida, Ont., Prince Welcome [472]; bay, stripe on face, white hind pasterns, foaled April 16th, 1886. Bred by R. Richardson, Millbrook, Ont.; sire, Criffel (imp.) [286] 1102 (2042); dam, Bessie [315], by Surprise (imp.) [226] 19 (845), etc.

STALLIONS, FOALED IN 1890.

1st prize, $30; 2nd, $20; 3rd, $10; 4th, $5; 5th, very highly commended; 6th, highly commended; 7th, commended.

1. H. H. Spencer, Brooklin, Ont., Gay Lad [2032] 5831; bay, white on off hind leg and nigh front foot; foaled May 28th, 1890. Bred by exhibitor; sire, Lawer's Baron Gordon (imp.) [1005] 4594 (5136); dam, Boydston Bess [2012] 2780, by Boydston Boy (imp.) [216] 1872 (111), etc.
2. R. J. Henders, Yelverton, Ont., Prince Oliver [2016]; dark bay, white face, hind feet white; foaled May 25th, 1890. Bred by exhibitor; sire, Oliver Twist (imp.) [873] (3043); dam, Boydston Belle [1796], by Boydston Boy (imp.) [216] 1872 (111), etc.
3. James McCartney, Thamesford, Ont., McGinty [1841]; bay, stripe on face, hind feet white; foaled April, 1890. Bred by exhibitor; sire, Norseman (imp.) [443] (4600); dam, Daunby [913], by Lorne (imp.) [1078] (500), etc.

4. W. Crawford & Sons, Brown's Corners, Ont., New Style [2021]; brown, stripe in face; foaled April 12th, 1890. Bred by exhibitor; sire Pride of Perth (imp.) [282] 2264 (2336); dam, Malvern Jennie [579] 165, by Young Broomfield (imp.) [211] 75, etc.
5. Chas. Bennett, Iris, Ont., Honest Joe [2003]; bay, star on face, off hind foot white; foaled April 15th, 1890. Bred by exhibitor; sire, Prince of Newton (imp.) [604] 5924); dam, Maggie of Fairview [427], by Garvald (imp.) [602] 5621, etc.
6. John McPherson, Brooghan, Ont., No. 6, Pickering Ladies' 2040); brown, small stripe in face, nigh fore foot and hind feet white; foaled July 15th, 1890. Bred by exhibitor; sire, Hector (710) 5865; dam, Fan Mac [845], by Joe the Banker (imp.) [129] 75, etc. This entry was received too late for insertion in catalogue.

STALLIONS, FOALED SUBSEQUENT TO JANUARY 1st, 1891.

1st prize, $20; 2nd, $15; 3rd, $10; 4th, $5; 5th, very highly commended; 6th, highly commended; 7th, commended.

1. John W. Clowe, Claremont, Ont., Brown John [2051]; bay, small star in face, little white on off fore foot, and hind foot white; foaled May 2nd, 1891. Bred by exhibitor; sire, Brown Jones (imp.) [781] 5566; dam, Jessie Redmond [2010], by Up to the Times (imp.) [2040] 1347, etc.
2. Chas. Bennett, Iris, Ont., Golden Hero [2000]; bay, star on face, off fore foot and hind legs white; foaled May 5th, 1891. Bred by exhibitor; sire, Golden Glen (imp.) [2001] 2002; dam, Maggie of Fairview [427], by Garvald (imp.) [602] 1621, etc.
3. Alex. Doherty, Ellesmere, Ont., Glen Isaac Boy [2002]; bay, star on forehead, hind feet white; foaled April 24th, 1891. Bred by exhibitor; sire, Self Esteem (imp.) [577] 5344]; dam, Queen of the Moor [784], by The Border Chief (imp.) [320] 13242], etc.

SWEEPSTAKES.—BEST CANADIAN BRED CLYDESDALE STALLION, ANY AGE, GIVEN BY THE INDUSTRIAL EXHIBITION ASSOCIATION.

Peter Kelly, Jr., Brooklin, Ont., Prince of Dollar [962].

REPORT OF THE PROVINCIAL FAT STOCK SHOW.

The following is the report of the Tenth Annual Provincial Fat Stock Show, under the management of the Agriculture and Arts Association of Ontario, the Guelph Fat Stock Club, the Sheep and Swine Breeders' Associations, held in the new Victoria Rink, Guelph, on Wednesday and Thursday, December 6 and 7, 1893:

EXECUTIVE OFFICERS.—Jas. Rowand, President; J. C. Snell, Chairman; H. Wade, Secretary.

COMMITTEE OF MANAGEMENT.—*From the Agriculture and Arts Association of Ontario:* Messrs. J. C. Snell, Edmonton; Joshua Legge, Carrington, N. Awrey, M.L.A., Hamilton; J. Stevens, Crown Hill; A. Rawlings, Forest, and H. Wade, Toronto.

Committee Fat Stock Club of Guelph.—Messrs. John I. Hobson, Mosboro'; James Millar, Guelph; Jas. Hearn, Guelph.

Committee Sheep Breeders' Association.—Alex Jackson, Abingdon; Richard Gibson, Delaware; F. W. Hodson, London.

Committee Swine Breeders' Association.—S. Coxworth, Claremont, and J. E. Brethour, Burford.

Committee on Cattle.—J. Stevens, A. Rawlings, J. Rowand, John I. Hobson, James Millar.

Committee on Sheep.—J. Jackson, J. Stevens, J. C. Snell, Richard Gibson, F. W. Hodson.

Committee on Swine.—J. E. Brethour, S. Coxworth, A. Rawlings, J. Legge.

Committee on Poultry.—James Anderson, James Hearn, W. Laing.

CATTLE.

Judge.—John Allison, Galt.

CLASS I.—SHORTHORNS.

Sec. 1.—Steer, two years and under three.

1st prize, $20; 2nd, $15; 3rd, $10.

1. W. B. Cockburn, Aberarder, Indian Lad; white, calved Jan. 16th, 1891. Bred by Arthur Johnston, Greenwood, Ont.; got by Indian Chief (imp.) —1110— (6748); dam, Daisy VI. —6783—, by General Armstrong —1826—, etc.

Sec. 2.—Steer, one year and under two.

1st prize, $20 ; 2nd, $15 ; 3rd $10.

1. H. & W. Smith, Hay, Village Hero ; calved in 1892 Bred by exhibitors ; got by Blake —15177 ; dam, Village Lily =15641=, by Prince Albert =3669=, etc.
2. Jas. Oke & Sons, Alvinston, Snowball ; white ; calved March 17, 1892 ; got by Oliver Twist =9 08= ; dam, Rory Princess 13th =7861=, by Rory Prince 3rd =2366=, etc.

Sec. 3.—Steer, under one year.

1st prize, $15 ; 2nd, $10 ; 3rd, $5.

1. Adam A. Armstrong, Fergus, Gara ; red ; calved Dec. 8th, 1892. Bred by Wm. Bichan, Fergus, Ont. ; got by George Stephen = 10476 = ; dam, Madge, by Lord Aberdeen = 3402 =, etc.

Sec. 4.—Cow or Heifer, three years and over.

1st prize, $20 ; 2nd, $15 ; 3rd, $10.

1. J. R. Caldwell, Fergus, Burnside Maid =Vol. 10= ; red roan ; calved Dec. 28th, 1889. Bred by Wm. Rennie, Fergus, Ont. ; got by Aberdeen Baron =6462= ; dam, Alice =2325=, by Bell Duke =1413=, etc.
2. W. B. Cockburn, Aberfoyle, Roseleaf =18116= ; dark roan ; calved Feb. 13th, 1889. Bred by Hon. John Dryden, Brooklin, Ont. ; got by Sussex (imp.) =6438= (56625) ; dam Fernleaf (imp.) =11024=, by Barmpton (37763), etc.
3. Thos. Russell & Son, Exeter, Bracelet V. —18147= ; red ; calved Jan. 2nd, 1889. Bred by exhibitors ; got by Mariner (imp.) =2720= ; dam, Bracelet II. (imp.) —2115=, by Chevalier (41223) etc,
4. W. B. Cockburn, Aberfoyle, Daisy Flower (imp.) =1014= ; roan ; calved March 3rd, 1885. Bred by E. Cruickshank, Lethenty, Scotland ; imported in 1887 by Hon. John Dryden, Brooklin, Ont. ; got by Perfection (37185) ; dam Daisy Bloom, by Ben Rinnes (37857), etc.

CLASS II.—HEREFORD.

Sec. 1.—Steer, two years and under three,

1st prize, $15 ; 2nd, $10 ; 3rd $5.

1. Henry McGurk, Colinville, Tredegar Duke [507] ; calved Dec. 28th, 1890. Bred by exhibitor ; sire, Lord Tredegar IV. [433] ; dam, Rosa IV. [494], by Lord Tredegar IV. [433], etc.

Sec. 4.—Hereford Cow or Heifer, three years and over.

1st prize, $15 ; 2nd, $10.

1. F. A. Fleming, Weston, Lily 6th (imp.) 23833 ; calved April 3rd, 1883. Bred by A. Partridge, Discoyd, Presteign, Eng. ; imported by exhibitor ; sire, Delight (5868) ; dam Lily 2nd, 21172, by Latitude 5th (6013) etc.

CLASS III.—POLLED ANGUS.

Sec. 4.—Cow or Heifer, three years and over.

1st prize, $15 ; second, $10.

1. Jas. Bowman, Guelph, Kyma II., O.E.F. [123] ; calved June 1st, 1886. Bred by the Ontario Agricultural College, Guelph, Ont. ; sire, Strathglass (imp.) [131] (2357) ; dam, Kyma (imp.) [75] (4969), by Etonian (1658), etc.

CLASS IV.—GALLOWAY.

Sec. 4.—Cow or Heifer, three years and over.

1st prize, $15 ; 2nd, $10.

1. D. McCrae, Guelph, Ranee IX., 5937 ; calved Nov. 1st, 1888. Bred by Thos. McCrae, Guelph ; sire, Black Crusader (4504) ; dam, Ranee IV., of Chapelton (5544), by Investment (1578), etc.
2. D. McCrae, Guelph, Lizzie VII. of Tarbroech (imp.) (8935) ; calved Jan. 12, 1885. Bred by James Cunningham, Tarbroech, Scotland ; sire, Harden (1151) ; dam, Lizzie IV. of Tarbroech (3438), by Larriston, (1030), etc.

CLASS V.—DEVON.

Sec. 2.—Steer, one year and under two.

1st prize, $15 ; 2nd, $10 ; 3rd, $5.

1. W. J. Rudd, Eden Mills, Clifford ; calved April 5th, 1892. Bred by exhibitor ; sire, Young Ensign [925] ; dam, Lady Creamer [929] by Marquis II. [871], etc.

Sec. 4.—Cow or Heifer, three years and over.

1st prize, $15; second, $10.

1. W. J. Rudd, Eden Mills, Tulip [1015]; calved June 4th, 1890. Bred by exhibitor; sire, Duke [947]; dam, Dido [951], by Victor [884], etc.

CLASS VI.—GRADE.

Judges.—John Allison, Galt; Henry Thurlow, Ferguson Vale.

Sec. 1.—Steer two years and under three.

1st prize, $25; 2nd, $20; 3rd, $10.

1. James Riddock, Everton, Eramosa.
2. Jas. Oke & Sons, Alvinston, Jupiter.
3. Thos. Russell & Son, Exeter, Captain.
4. J. R. Caldwell, Fergus, Frank.

Sec. 2.—Grade Steer, one year and under two.

1st prize, $20; 2nd, $15; 3rd, $10.

1. Jas. Oke & Sons, Alvinston, Mars.
2. Stewart Bros., Everton, Sandy.
3. A. & F. Bolton, Armstrong's Mills, Bolton's Pride.
4. A. A. Armstrong, Fergus, Whitewash.

Sec. 3.—Grade Steer, under one year.

1st prize, $15; 2nd, $10; 3rd, $5.

1. D. D. Wilson, Seaforth, Spot.
2. A. & F. Bolton, Armstrong's Mills, Guelph King.
3. D. D. Wilson, Seaforth, Red Rose.
4. James Oke & Sons, Alvinston, Mercury.

Sec. 4.—Grade Cow or Heifer, three years and over.

1st prize, $20; 2nd, $15; 3rd, $10.

1. Jas. Rennie, Wick, Lady.
2. J. R. Caldwell, Fergus, Lily.
3. D. D. Wilson, Seaforth, Nettie.
4. W. C. Short, Salem, Ruby.

Sec. 5.—Grade Heifer, under three years.

1st prize, $20; 2nd, $15; 3rd, $10.

1. James Oke & Sons, Alvinston, Diana.
2. Jas. Rennie, Wick, Queen.
3. Jas Rennie, Wick, Daisy.
4. J. R. Caldwell, Fergus, Snowball.

CHAMPIONSHIP PRIZE.

Best Fat Animal of any Breed or Sex.

Silver Medal, given by the Agriculture and Arts Association. Same animals as in above sections.

1. James Rennie, Wick, Lady, S. H. Grade.

SHEEP.

Judges.—James Russell, Richmond Hill; Arthur Simonton, Blackheath.

CLASS VIII.—LONGWOOLS, COTSWOLDS, LINCOLNS AND LEICESTERS.

Sec. 1.—Ewe, one year and under two.

1st prize, $15; 2nd, $10; 3rd, $5.

1. Gibson & Walker, Denfield, (Lincoln), Chester Queen (imp.), 106; lambed Feb., 1892. Bred by Hy. Dudding, Lincoln, Eng.; sire, Young Scopelick (588); dam, a Dudding ewe, etc.
2. Wm. Oliver, Avonbank, (Lincoln), Oliver's No. 8 (imp.) 8; lambed spring, 1892. Bred by Robert Wright, Norton Heath, Eng.; imported by exhibitor; sire, Royal Doncaster (386); dam, a Wright ewe, etc.

3. John Kelly, Shakespeare, (Leicester), Twilight, 367 ; lambed March, 1892. Bred by exhibitor ; sire, Gaiety, 284 ; dam, Lady Thompson, etc.
4. Jas. Snell, Clinton, (Leicester), Maggie S., 516 ; lambed April 4th, 1892. Bred by exhibitor ; sire, Knight of Maple Lodge V., 272 ; dam, Mrs. Twentyman, 407, etc.

Sec. 2.—Ewe, under one year.

1st prize, $10 ; 2nd, $6 ; 3rd, $4.

1. Wm. Oliver, Avonbank, Oliver's No. 44, 34 ; lambed spring, 1893. Bred by exhibitor ; sire, Oliver's No. 9, 9 ; dam, Oliver's No. 15, 15, etc.
2. John Kelly, Shakespeare, (Leicester), C82, 741 ; lambed March, 1893. Bred by exhibitor ; sire, Jimmy, 283 ; dam, C79, 512, etc.
3. John Kelly, Shakespeare, (Highland Lass), 740 ; lambed March, 1893. Bred by exhibitor ; sire, Jimmy, 283 ; dam, Highland Maid, etc.
4. Gibson & Walker, Denfield, (Lincoln), Gibson & Walker's 30, 115 ; lambed March, 1893. Bred by exhibitors ; sire Riby Favorite, 80 ; dam, Gibson & Walker's 3, etc.

Sec. 3.—Wether, one year and under two.

1st prize, $15 ; 2nd, $10 ; 3rd, $5.

1. John Rutherford, Roseville, (Leicester), David R, 732 ; lambed spring, 1892. Bred by J. Kelly, Shakespeare , sire, Turner, 188 ; dam, Thomsy, 66, etc.
2. John Rutherford, Roseville, (Leicester), Chief, 856.
3. John Rutherford, Roseville (Lincoln), I. R. II.
4. John Rutherford, Roseville, (Leicester), Daniel R., 731 ; lambed spring, 1892. Bred by J. Kelly, Shakespeare ; sire, Turner, 188 ; dam, Thomsy, 66, etc.

Sec. 4.—Wether, under one year.

1st prize, $10 ; 2nd, $6 ; 3rd, $4.

1. John Kelly, Shakespeare, (Leicester), Big Will, 839 ; lambed, Feb., 1893. Bred by exhibitor ; sire, Gaiety, 284 ; dam, Nell, etc.
2. John Orr, Galt, (Leicester), Champion ; lambed April 15th, 1893. Bred by exhibitor ; sire, Marshall Ram ; dam, Marshall C., by Marshall Ram (imp.), etc.
3. John Rutherford, Roseville, (Leicester), Jack I., 743 ; lambed April 10th, 1893. Bred by exhibitor ; sire, Jim ; dam, Lady Jess.
4. John Kelly, Shakespeare, (Leicester), Jim, 841 ; lambed March, 1893. Bred by exhibitor ; sire, Jimmy, 283 ; dam, Blue Bell, etc.

Sec. 5.—3 Ewes, under one year.

1st prize, $20 ; 2nd, $15 ; 3rd, $10.

1. John Kelly, Shakespeare, (Leicester) :
   Nancy, 737 ; lambed March, 1893. Bred by exhibitor ; sire, Jimmy, 283 ; dam, Haymount (imp.), etc.
   Sunlight, 738 ; lambed March, 1893. Bred by exhibitor ; sire, Jimmy, 283 ; dam, Connie, etc.
   CA. 840 ; lambed March, 1893. Bred by exhibitor ; sire, Gaiety, 284 ; dam C3, 378, etc.
2. Gibson & Walker, Denfield, (Leicester) :
   Gibson & Walker's 30, 115. (See above).
   Gibson & Walker's 103, 155. "
   Gibson & Walker's 104, 156. "
3. W. Whitelaw, Guelph, (Leicester) :
   Minnie May II., 848. (See above).
   Queen II., 851 ; lambed spring, 1893. Bred by exhibitor ; sire, Kelly, 242 ; dam, Queen, etc.
   Helen II., 847 ; lambed spring, 1893. Bred by exhibitor ; sire, Knocker, 458 ; dam, Helen, etc.
4. John Kelly, Shakespeare, (Leicester) :
   C82, 741. (See above).
   Sunshine, 739. "
   Highland Lass, 740. "

Sec. 6.—3 Wethers, under one year.

1st prize, $20 ; 2nd, $15 ; 3rd, $10.

1. John Kelly, Shakespeare, (Leicester) :
   Big Will, 839. (See above).
   Jim, 841. "
   Bill, 842. "
2. John Rutherford, Roseville, (Leicester) :
   Jack 2nd, 744 ; lambed April 10th, 1893. Bred by exhibitor ; sire, Jim ; dam, Lady Jess, etc
   Lorne.
   Henry.

Sec. 7.—5 Sheep, under two years, bred by Exhibitor.

1st prize, $25.

1. Gibson & Walker, Denfield (Lincoln):
   Gibson & Walker's 24, 319. (See above).
   No. 13, 454. "
   No. 21, 317. "
   Gibson's No. 1, 314. "
   Gibson's No. 3, 317. "

CLASS IX.—OXFORD, HAMPSHIRE OR SHROPSHIRE.

Sec. 1.—Ram, one year and under two.

1st prize, $15; 2nd, $10; 3rd, $5.

1. John Campbell, Woodville, (Shropshire), Campbell's 424, 53071; lambed spring, 1892. Bred by exhibitor; sire, Newton Lord (imp.), 30983; dam, Campbell's 205, 14479, etc.
2. John Campbell, Woodville, (Shropshire), Campbell's 447, 43547; lambed spring, 1892. Bred by exhibitor; sire, Newton Lord (imp.), 30983; dam, Campbell's 313, 24087, etc.
3. W. E. Wright, Glanworth (Shropshire), Medcraf's 282, 45256; lambed March, 1892. Bred by W. Medcraft & Sons, Sparta, Ont; sire, Sheldon's Pride, 26415; dam, Sheldon's 14, 26386, etc.
4. John Campbell, Woodville, (Shropshire), Campbell's 422, 43544, lambed spring, 1892. Bred by exhibitor; sire, Newton Lord (imp.), 30983; dam, Campbell's 214, 14485, etc.

Sec. 2.—Ewe, under one year.

1st prize, $10; 2nd, $6; 3rd, $4.

1. John Campbell, Woodville, (Shropshire), Campbell's 510, 56995; lambed spring, 1893. Bred by exhibitor; sire, Royal Doncaster 2nd, 30089; dam, Campbell's 225, 14488, etc.
2. W. H. Beattie, Wilton Grove, (Shropshire), Beattie's 388, 56951; lambed spring, 1893. Bred by exhibitor; sire, Columbia 2nd, 29253; dam, Beattie's 40, 11539, etc.
3. D. G. Hanmer & Sons, Mount Vernon, (Shropshire), Hanmer's 173, 57001; lambed March, 1893. Bred by exhibitors; sire, Woolmerchant (imp.), 19297; dam, Miller's 1569, 28047, etc.
4. W. H. Beattie, Wilton Grove, (Shropshire), Beattie's 390, 56953; lambed spring, 1893. Bred by exhibitor; sire, Columbia 2nd, 29253; dam, Beattie's 42, 11541, etc.

Sec. 3.—Wether, one year and under two.

1st prize, $15; 2nd, $10; 3rd, $5.

1. John Rutherford, Roseville, (Hampshire), Burton.
2. John Rutherford, Roseville, (Hampshire), Barney 585; lambed March 18th, 1892. Bred by Ontario Agricultural College, Guelph, Ont.; sire, Young Edwin James; dam, Lady Crowmarsh II., 1074, etc.
3. W. E. Wright, Glanworth, (Shropshire), Wright's 95, 39698; lambed spring, 1892. Bred by exhibitor; sire, Wright's 26, 31107; dam, Hawkshaw's 102, 26341, etc.
4. John Campbell, Woodville, (Shropshire), Energy, 53468; lambed spring, 1892. Bred by exhibitor; sire, Rare Stamp, 28077; dam, Campbell's 219, 28074, etc.

Sec. 4.—Wether, under one year.

1st prize, $10; 2nd, $6; 3rd, $4.

1. W. H. Beattie, Wilton Grove, (Shropshire), Beattie's 427; lambed spring, 1893. Bred by exhibitor; sire, Columbia, 29253; dam, Beattie's 4, 6676, etc.
2. D. G. Hanmer & Son, Mount Vernon, (Shropshire), Hanmer's 201, lambed spring, 1893. Bred by exhibitors.
3. W. H. Beattie, Wilton Grove, (Shropshire), Beattie's 428, lambed spring, 1893. Bred by exhibitor; sire, Columbia, 29253; dam, Beattie's 1, 6675, etc.
4. W. H. Beattie, Wilton Grove, (Shropshire), Beattie's 429, lambed spring, 1893. Bred by exhibitor; sire, Columbia, 29253; dam, Beattie's 1, 6675, etc.

Sec. 5.—5 Lambs, under one year.

1st prize, $20. 2nd, $15. 3rd, $10.

1. John Campbell, Woodville, (Shropshire):
   Campbell's 523, 59978. (See above.)
   " 508, 56994 "
   " 510, 56995 "

2. W. E. Wright, Glanworth, (Shropshire):
   Wright's 75, 58029. (See above.)
   " 80, 58031. "
   " 94, 58039. "
3. W. H. Beattie, Wilton Grove, (Shropshire):
   Beattie's 388, 56951. (See above.)
   " 390, 56953. "
   " 423, "

Sec. 6.—3 Wethers, under one year.

1st prize, $20; 2nd, $15; 3rd, $10.

1. W. H. Beattie, Wilton Grove, (Shropshire):
   Beattie's 427. (See above.)
   " 428. "
   " 429. "

Sec. 7.—5 Sheep, under two years, bred by exhibitor.

1st prize, $25.

1. John Campbell, Woodville, (Shropshire):
   Campbell's 421, 53070; lambed spring, 1892. Bred by exhibitor; sire, Newton Lord, 30983; dam, Campbell's 226, 14489, etc., and 4 of animals above.

CLASS X.—SOUTHDOWN, DORSET OR MERINO.

Sec. 1.—Ewe, one year and under two.

1st prize, $15; 2nd, $10; 3rd, $5.

1. T. C. Douglas, Galt, (Southdown), Blythe Ewe, 154 (imp.), 5957; lambed in 1892. Bred by James Blythe, Stanstead, Sussex, Eng.; imported by exhibitor; sire, King of the Castle; dam, E. F. B. Ewe (153), etc.
2. T. C. Douglas, Galt, (Southdown), E. F. B. Ewe, 155 (imp.), 5958; lambed in 1892. Bred by James Blythe, Stanstead, Sussex, Eng.; sire, Coleman VI.; dam, E. F. B. Ewe, 152, etc.
3. T. C. Douglas, Galt, (Southdown), E. F. B. Ewe, 156 (imp.), 5959; lambed in 1892. Bred by James Blythe, Stanstead, Sussex, Eng.; sire, Coleman VI.; dam, E. F. B. Ewe, 151, etc.

Sec. 2.—Ewe, under one year.

1st prize, $10; 2nd, $6; 3rd, $4.

1. T. C. Douglas, Galt, (Southdown), Douglas Ewe 41, 5733; lambed spring, 1893. Bred by exhibitor; sire, Streetly II. (imp.), 5004; dam, Douglas Ewe 24, 4179, etc.
2. R. Shaw & Son, Glanford Station, (Southdown), Nellie, 6026; lambed spring, 1893. Bred by exhibitors; sire, Duke of Cambridge, 2944; dam, May, 5351, etc.
3. R. Shaw & Son, Glanford Station, (Southdown), Ella, 73; lambed spring, 1893. Bred by exhibitors; sire, Duke of Cambridge, 2944; dam, Jonas Ewe, etc.
4. T. C. Douglas, Galt, (Southdown), Douglas Ewe 40, 5732; lambed spring, 1893. Bred by exhibitor; sire, Streetly II. (imp.), 5004; dam, Jonas Ewe 3, 5001, etc.

Sec. 3.—Wether, one year and under two.

1st prize, $15; 2nd, $10; 3rd, $5.

1. John Rutherford, Roseville, (Southdown), Lorne, 5975; lambed April 10th, 1892. Bred by exhibitor; sire, King John, 3977; dam, Jonas Ewe 41, 2097, etc.
2. R. Shaw & Son, Glanford Station, (Southdown), Rover, ——; lambed spring, 1892. Bred by exhibitor; sire, Duke of Cambridge, 2944; dam, Jonas Ewe, 2986, etc.
3. T. C. Douglas, Galt, (Southdown), King John VIII., 5672; lambed spring, 1892. Bred by exhibitor; sire, King John VII., 3977; dam, Douglas Ewe 19, 3973, etc.

Sec. 4.—Wether, under one year.

1st prize, $10; 2nd, $6; 3rd, $4.

1. D. H. Dale, Glendale, (Southdown), Bunker Hill, 39; lambed April 15th, 1893. Bred by exhibitor; sire, Cambridgeshire, 5026; dam, Webb Ewe, 5843, etc.
2. D. H. Dale, Glendale, (Southdown), Heavy Weight, 45; lambed May 2nd, 1893. Bred by exhibitor; sire, Cambridgeshire, 5026; dam, Jonas Ewe, 5, 5032, etc.
3. D. H. Dale, Glendale, (Southdown), Surprise 42; lambed March 20th, 1893. Bred by exhibitor; sire, Dale's 18, 5969; dam, Coleman Ewe, 4, 5027, etc.

Sec. 5.—*Ewes, under one year.*

1st prize, $20; 2nd, $15; 3rd, $10.

1. R. Shaw & Son, Glanford Station, (Southdown)
   Winnie, 6028. (See above.)
   Ella, 73. "
   Nellie, 6026. "
2. T. C. Douglas, Galt, (Southdown)
   Douglas Ewe 39, 5741. (See above.)
   " 40, 5782 "
   " 41, 5739 "

Sec. 6.—*Wethers, under one year.*

1st prize, $20; 2nd, $15; 3rd, $10.

1. D. H. Dale, Glendale, (Southdown):
   Bunker Hill, 39.
   Heavy Weight, 45.
   Surprise, 42.
2. John Rutherford, Russville, (Southdown):
   Derby, 6109; lambed May 1st, 1893. Bred by exhibitor; sire, Essex, 118, 5003; dam, Nutt 111., 5974, etc.
   Dandy, 6189; lambed April 16th, 1893. Bred by exhibitor; sire, Essex, 118, 5003; dam, Nell L., 6187, etc.
   Billy, 6188; lambed April 16th, 1893. Bred by exhibitor; sire, Essex, 118, 5003; dam, Nell L., 6187, etc.
3. T. C. Douglas, Galt, (Southdown):
   Streaky VI., 5727. (See above.)
   Essex VI., 5728. "
   Streaky V., 5726. "

Sec. 7.—*Shrop, under two years, bred by exhibitor.*

1st prize, $25.

1. R. Shaw & Son, Glanford Station, (Southdown)
   Jane, 76; lambed spring, 1892. Bred by exhibitors; sire, Duke of Cambridge 12; dam, Coleman Ewe 53, etc.
   Kate, 77; lambed spring, 1892. Bred by exhibitors; sire, Duke of Cambridge 32; dam, Coleman Ewe 53, etc.
   Fanny 78; lambed spring, 1892. Bred by exhibitors; sire, Duke of Cambridge 32; dam, Coleman Ewe, etc.
   Ewe 74; lambed spring, 1892. Bred by exhibitors; sire, Duke of Cambridge 32; dam, Jessa Ewe, 52, etc.
   Ram. (See above.)

Grade Shropshires.

Sec. 8.—*Pen of Wethers, any breed, under two years old. Bred by exhibitor.*

1st prize, $20.

1. John Rutherford, Russville, Champion.

Sec. 9.—*Pen of Ewes, any breed, under two years old. Bred by exhibitor.*

1st prize, $20.

1. Gibson & Walker, Deerfield, Missouri.

Sec. 10.—*Special prize, given by American Southdown Breeders' Association, value $, for best two lambs, ram and ewe, bred and owned in Ontario by a member of the Province, the animals to be recorded in the American Southdown Record 18. E. Peaslee, Secretary. (No lambs published entitled to that record).*

1. R. Shaw & Son, Glanford Station, (Southdown):
   Jane 75; lambed spring, 1892. Bred by exhibitors; sire, Duke of Cambridge, 32; dam, Coleman Ewe 53, etc.
   Kate 77; lambed spring, 1892. Bred by exhibitors; sire, Duke of Cambridge, 32; dam, Coleman Ewe 53, etc.

GRADE.

Sec. 1.—Ewe, two years and over.

1st prize, $12; 2nd, $8; 3rd, $4.

1. John Campbell, Woodville, Smith's Choice.
2. John Young, Abingdon, Lucy.
3. R. Shaw & Son, Glanford Station, Sunbeam.
4. Jas. Scott, Aberfoyle, Nellie.

Sec. 2.—Wether, two years and over.

1st prize, $12; 2nd, $8; 3rd, $4.

1. John Rutherford, Roseville, Jumbo.
2. John Rutherford, Roseville, Hood.
3. John Rutherford, Roseville, Dixie.

Sec. 3.—Ewe, one year and under two.

1st prize, $12; 2nd, $8; 3rd, $4.

1. Gibson & Walker, Denfield, Curly Skin.
2. John Young, Abingdon, Mite.
3. Gibson & Walker, Denfield, Little Belle.
4. John Young, Abingdon, Pansy.

Sec. 4.—Wether, one year and under two.

1st prize, $12; 2nd, $8; 3rd, $4.

1. John Campbell, Woodville, Ken.
2. W. E. Wright, Glanworth, Wright's 8.
3. W. E. Wright, Glanworth, Wright's 9.
4. W. E. Wright, Glanworth, Wright's 7.

Sec. 5.—3 Ewes, under one year.

1st prize, $20; 2nd, $15; 3rd, $10.

1. Bowman Bros., Mount Forest:
   Ada.
   Annie.
   Jen.
2. D. G. Hanmer & Son, Mount Vernon:
   Nell.
   Lou.
   Mab.
3. H. Hanmer, Mount Vernon:
   Hanmer's 1.
   " 2.
   " 3.
4. W. H. Beattie, Wilton Grove:
   Beattie's 3.
   " 4.
   " 5.

Sec. 6.—3 Wethers, under one year.

1st prize, $20; 2nd, $15; 3rd, $10.

1. H. Hanmer, Mount Vernon:
   Hanmer's 4.
   " 5.
   " 6.
2. D. G. Hanmer & Son, Mount Vernon:
   Pork.
   Ham.
   Bacon.
3. Jas. Bowman, Guelph:
   Jim.
   Cully.
   Frank.
4. John Rutherford, Roseville:
   Andy.
   Ally.
   Alex.

Sec. 7.—Wether, any age.

1st prize, $10.

1. John Rutherford, Roseville, Jumbo.

Sec. 8.—Ewe, any age.

1. John Campbell, Woodville, Smith's Choice.

SWINE.

Judges—James Main, Milton; James Anderson, Guelph; J. E. Brethour, Burford.

Class XII.—Berkshire.

Sec. 1.—Barrow, over nine months and under eighteen.

1st prize, $12; 2nd, $8; 3rd, $4.

1. J. G. Snell & Bro., Edmonton, Sam —2691—; farrowed October 23rd, 1892. Bred by exhibitors; sire, Enterprise (imp.) —1378—; dam, Savernake's Daughter (imp.) —1919—, by Random (1348), etc.
2. George Green, Fairview, King —2648—; farrowed September 7th, 1892. Bred by exhibitor; sire, Lord Belmont —1498—; dam, Black Bet (imp.) —1373—, by Tinker 3rd, etc.
3. D. Barbeau, Corwin, Hero —2865—; farrowed September 29th, 1892. Bred by John Kitching, Corwin; sire, Captain Corwin —1881—; dam, Fancy —1915—, by Lord Dufferin —1022—, etc.

Sec. 2.—Barrow, nine months and under.

1st prize, $10; 2nd, $6; 3rd, $4.

1. W. E. Wright, Glanworth, Black Joe —2646—; farrowed March 9th, 1893. Bred by exhibitor; sire, Lord Somerset —1555—; dam, Lady Grey —1343—, by Earl of Dutton —753—, etc.
2. George Green, Fairview, Nigger —2690—; farrowed May 25th, 1893. Bred by exhibitor; sire, Golden Prince —2528—; dam, Lady Pollard —2691—, by Lord Pollard —656—, etc.
3. George Green, Fairview, Prince —2700—; farrowed May 25th, 1893. Bred by exhibitor; sire, Golden Prince —2528—; dam, Lady Pollard —2691—, by Lord Pollard —653—, etc.

Sec. 3.—Sow, over nine months and under eighteen.

1st prize, $12; 2nd, $8; 3rd, $4.

1. George Green, Fairview, Chip —2882—; farrowed September 7th, 1892. Bred by exhibitor; sire, Lord Belmont —1498—; dam, Newport Maid —2419—, by Mariner —902—, etc.
2. Thomas Watson, Springvale, Haldimand, Queen —2851—; farrowed September 11th, 1892. Bred by exhibitor; sire, May Duke —1986—; dam, Maybell —2501—, by Sovereign Hope —651—, etc.
3. P. McGee, Guelph, Jane —3029—; farrowed June 27th, 1892. Bred by exhibitor; sire, Shamrock —487—; dam, Lady Jane —967—, by Golden Treasure (imp.) —482—, etc.
4. Thomas Watson, Springvale, Walpole Belle —2855—; farrowed September 11th, 1892. Bred by exhibitor; sire, May Duke —1986—; dam, Maybell —2501—, by Sovereign Hope —651—, etc.

Sec. 4.—Sow, nine months and under.

1st prize, $10; 2nd, $6; 3rd, $4.

1. R. D. Addison, Otterville, Lady Ranger —3054—; farrowed April 7th, 1893. Bred by exhibitor; sire, Long Range (imp.) —1878—; dam, Lass of Riverside II —1669—, by Royal Saxon —880—, etc.
2. J. G. Snell & Bro., Edmonton, Carnation —3021—; farrowed April 10th, 1893. Bred by exhibitors; sire, Enterprise (imp.) —1378—; dam, Savernake's Daughter (imp.) —1919—, by Random (1348), etc.
3. J. G. Snell & Bro., Edmonton, Graceful —3029—; farrowed April 10th, 1893. Bred by exhibitors; sire, Enterprise (imp.) —1378—; dam, Savernake's Daughter (imp.) —1919—, by Random (1348), etc.

Sec. 5.—Pair, the offspring of one boar, bred by exhibitor.

1st prize, $20; 2nd, $15; 3rd, $7.

1. J. G. Snell & Bro., Edmonton
   Flirtation —3019—. (See above.)
   Graceful —3029—. "
   Carnation —3021—. "
2. George Green, Fairview.
   Royal —2697—. (See above.)
   King —2698—. "
   Maid —3042—. "
3. J. G. Snell & Bro., Edmonton
   May Morn —3022—; farrowed May 16th, 1893. Bred by exhibitors; sire, Prince Regent —1396—; dam, Trifle —2795—, by Enterprise (imp.) —1378—, etc.

CLASS XIII—POLAND CHINA.

Sec. 1.—Barrow, over nine months and under eighteen.

1st prize, $12; 2nd, $8; 3rd, $4.

1. W. M. & J. C. Smith, Fairfield Plains, Dandie —487—; farrowed July 17th, 1892. Bred by exhibitors; sire, Ben —236—; dam, Carrie —261—, by Abe —235—, etc.

Sec. 2.—Barrow, nine months and under.

1st prize, $10; 2nd, $6; 3rd, $4.

1. W. M. & J. C. Smith, Fairfield Plains, Regie —488—; farrowed March 23rd, 1893. Bred by exhibitors; sire, Monarch —443—, dam, Pride of Albion IX. —490—; by King Egbert —415—, etc.
2. W. M. & J. C. Smith, Fairfield Plains, Jack.

Sec. 3.—Sow, over nine months and under eighteen.

1st prize, $12; 2nd, $8; 3rd, $4.

1. W. &. F. Row, Avon, Nellie —629—; farrowed Sept. 16th, 1892. Bred by exhibitors; sire, Fountain King —369—; dam, Avon Belle —545—, by Corwin U.S., 17081 O., etc.
2. W. & F. Row, Avon, Mollie —628—; farrowed Sept. 10th, 1892. Bred by exhibitors; sire, Fountain King —369—; dam, Avon Belle —545—, by Corwin U.S., 17081 O., etc.
3. W. M. & J. C. Smith, Fairfield Plains, Louise —632—; farrowed July 17th, 1892. Bred by exhibitors; sire, Ben —236—; dam, Carrie —251—, by Abe —235—, etc.
4. W. M. & J. C. Smith, Fairfield Plains, Ada —633—; farrowed December 24th, 1892. Bred by exhibitors; sire, Ben —236—; dam, Carrie —261—, by Abe —235—, etc.

Sec. 4.—Sow, nine months and under.

1st prize, $10; 2nd, $6; 3rd, $4.

1. W. & F. Row, Avon, Minnie —631—; farrowed March 20th, 1893. Bred by exhibitors; sire, Fountain King —369—; dam, Fancy —617—, by Corwin Tecumseh, 51088 O., etc.
. W. & F. Row, Avon, Susie —632—; farrowed March 25th, 1893. Bred by exhibitors; sire, Prince Elgin —463—; dam, curly —590—, by Fountain King —369—, etc.
3. W. M. & J. C. Smith, Fairfield Plains, Pride of Brant —634—; farrowed March 23rd, 1893. Bred by exhibitors; sire, Monarch —443—; dam, Pride of Albion IX —490—, by King Egbert —415—, etc.
4. W. M. & J. C. Smith, Fairfield Plains, Pride of Fairfield —596—; farrowed March 23rd, 1893. Bred by exhibitors; sire, Monarch —443—; dam, pride of Albion IX. —490, by King Egbert —415—, etc.

Sec. 5.—Three Pigs the offspring of one Sow Bred by exhibitor.

1st prize, $20; 2nd, $15; 3rd, $10.

1. W. & F. Row, Avon, Fancy —617—; farrowed April 25th, 1890. Bred by J. A. Shipley, Richwood, Ohio, U.S.; sire, Corwin Tecumseh, 51088 O.; dam, Avon Belle —545—, by Corwin U.S., 17081 O., etc.
   Mollie —628—.
   Nellie —629—.
2. W. M. & J. C. Smith, Fairfield Plains:
   Regie —488—.
   Pride of Fairfield —596—.
   Pride of Brant —634—.
3. W. M. & J. C. Smith, Fairfield Plains:
   Dandie —487—.
   Louise —632—.
   Ada —633—.

CLASS XIV—YORKSHIRE.

Sec. 1.—Barrow, over nine months and under eighteen.

1st prize, $12; 2nd, $8; 3rd, $4.

1. Jos. Featherston, Streetsville, Holywell Y. —789—; farrowed Sept. 8th, 1892. Bred by exhibitor; sire, J.Y. —416—; dam, Holywell Royalty (imp.) —58—, by Holywell Judge (993), etc.
2. Jos. Featherston, Streetsville, Prescott Prince —1132—; farrowed June 30th, 1892. Bred by exhibitor; sire, J. Y. —416—; dam, Princess Union (imp.) —683—, by Prescott 6th (1387), etc.

Sec. 1.—Sow, over nine months and under eighteen.

1st prize, $12; 2nd, $8; 3rd, $4.

1. Robt. Chadwick, Bernhamthorpe, Nora —1298—; farrowed Sept. 14th, 1892. Bred by exhibitor; sire, Prescott Guardian (imp.) —111—; dam, Prescott Lady —514—, by Worsley Count (imp.) —110—, etc.

Sec. 2.—Sow, over six months and under.

1st prize, $10; 2nd, $6; 3rd, $4.

1. J. E. Brethour, Burford, Buttercup Maiden 6th —1313—; farrowed March 8th, 1893; sire, Holywell Emigrant (imp.) —173—; dam, Buttercup —352—; by Rover —13—, etc.
2. J. E. Brethour, Burford, Henrietta 3rd —1314—; farrowed March 18th, 1893; sire, Oxford Lad (imp.) —235—; dam, Helen 3rd —675—; by Sultan (imp.) —12—, etc.
3. J. E. Brethour, Burford, Mollington Ruth 2nd —1315—; farrowed May 23rd, 1893; sire, Stamina —269—; dam, Mollington Ruby (imp.) —218—, by Jacko (1037), etc.

Sec. 3.—Three Pigs (the progeny of one Sow). Bred by the exhibitor.

1st prize, $20; 2nd, $15; 3rd, $7.

1. J. E. Brethour, Burford, Mollington Ruth 2nd —1315—; —— 3rd —1316—; —— 4th —1317—; bred by exhibitor; sire, Stamina —269—; dam, Mollington Ruby (imp.) —218—, by Jacko (1037), etc.

CLASS XV—CHESTER WHITE.

Sec. 1.—Boar, over nine months and under eighteen.

1st prize, $12; 2nd, $8; 3rd, $4.

1. R. H. Harding, Thorndale, Sir John —299—; farrowed October, 1892. Bred by exhibitor; sire, Buckeye Boy —138—; dam, Sarah —305—, by Broadbrim —128—, etc.
2. H. George & Sons, Cramptom, Jumbo —344—; farrowed October 29th, 1892. Bred by exhibitors; sire, Uncle Sam —105—; dam, U. S. Maid —215—, by Clymer —149—, etc.

Sec. 2.—Boar, over six months and under.

1st prize, $10; 2nd, $6; 3rd, $4.

1. H. George & Sons, Cramptom, Sir John —345—; farrowed May 10th, 1893. Bred by exhibitors; sire, Uncle Sam —105—; dam, Favorite —253—, by Middlesex —75—, etc.
2. H. George & Sons, Cramptom, Get There —346—; farrowed May 10th, 1893. Bred by exhibitors; sire, Uncle Sam —105—; dam, Favorite —253—, by Middlesex —75—, etc.
3. R. H. Harding, Thorndale, Bright Eye —343—; farrowed July, 1893. Bred by exhibitor; sire, Silver Chief —66—; dam, Sarah —305—, by Broadbrim —128—, etc.

Sec. 3.—Sow, over nine months and under.

1st prize, $12; 2nd, $8; 3rd, $4.

1. R. H. Harding, Thorndale, Elegant —306—; farrowed Oct., 1892. Bred by exhibitor; sire, Buckeye Boy —138—; dam, Sarah —305—, by Broadbrim —128—, etc.
2. H. George & Sons, Cramptom, Topsy —429—; farrowed Aug. 20th, 1892. Bred by exhibitors; sire, Uncle Sam —105—; dam, Jennie —216—, by Royal —72—, etc.
3. H. George & Sons, Cramptom, Pride of Ontario —370—; farrowed October 29th, 1892. Bred by exhibitors; sire, Uncle Sam —105—; dam, U. S. Maid —215—, by Clymer —149—, etc.

Sec. 4.—Sow, over six months and under.

1st prize, $10; 2nd, $6; 3rd, $4.

1. R. H. Harding, Thorndale, Rosie —294—; farrowed March 29th, 1893. Bred by H. George & Sons, Cramptom, Ont.; sire, Victor —265—; dam, Perfection —344—, by Royal —72—, etc.
2. H. George & Sons, Cramptom, Miss Cleveland —431—; farrowed April 17th, 1893. Bred by exhibitors; sire, Victor —265—; dam, Jennie —216—, by Royal —72—, etc.
3. W. E. Wright, Glanworth, Glanworth Lass —406—; farrowed May 18th, 1893. Bred by exhibitor; sire, Glanworth King —228—; dam, Glanworth Maid —201—, by Silver Chief —66—, etc.
4. H. George & Sons, Cramptom, Dora —430—; farrowed April 14th, 1893. Bred by exhibitors; sire, Lord Nelson —102—; dam, U. S. Maid —215—, by Clymer —149—, etc.

Sec. 5.—Three Pigs the offspring of one Sow. Bred by exhibitor.

1st prize, $20 ; 2nd, $15 ; 3rd, $7.

1. H. George & Sons, Crampton :
   Jumbo —344—. (See above).
   Pride of Ontario —370—. "
   Dora —430—. "
2. H. George & Sons, Crampton :
   Topsy —429—. (See above).
   Canada's Pride —369— ; farrowed December 2nd, 1892. Bred by exhibitors ; sire, Lord Nelson —102— ; dam, Jennie —216—, by Royal —72—, etc.
3. R. H. Harding, Thorndale :
   Sir John —299—. (See above).
   Bright Eye —342—. "
   Elegant —366—. "

CLASS XVI—TAMWORTH OR JERSEY.

Sec. 1.—Barrow, nine months and under eighteen.

1st prize, $12 ; 2nd, $8 ; 3rd, $4.

1. John Bell, Amber, (Tamworth), Adam —101— ; farrowed Aug. 20th, 1892. Bred by exhibitor ; sire, Norman's Pride, (imp.), —1— ; dam, Lamaroux Susie, (imp.), —13—, by The Swell (16571), etc.

Sec. 2.—Barrow, nine months and under.

1st prize $10, 2nd $6, 3rd $4.

1. Isaac Holland, Avon, (Tamworth) Tom —86— ; farrowed May 1st, 1893. Bred by exhibitor ; sire, Tippo Sahib (imp.) —59— ; dam, Dorridge Ruby II. (imp.) —103—, by Whitacre Duke (2249), etc.
2. Isaac Holland, Avon, (Tamworth) Bob —87— ; farrowed May 1st, 1893. Bred by exhibitor ; sire, Tippo Sahib (imp.) —59— ; dam, Dorridge Ruby II. (imp.) —103—, by Whitacre Duke (2249), etc.
3. Isaac Holland, Avon : Joe —93—. Bred by exhibitor ; sire, Tippo Sahib (imp.) —59— ; dam, Dorridge Ruby II. (imp.) —103— , etc.
4. Thos. George, Mount Elgin, (Tamworth) Gladstone —90— ; farrowed June 17th, 1893; Bred by exhibitor ; sire, Short Nose (imp.) —88— ; dam, Countess II. (imp.) —105—, by Gun Hill Prince (1591), etc.

Sec. 3.—Sow, over nine months and under eighteen.

1st prize $12, 2nd $8, 3rd $4.

1. Ellerys & Stevens, Salford, (Jersey) Mayflower ; farrowed Sept. 28th, 1892. Bred by exhibitors ; sire, Roger, 2259 ; dam, Aunt Vira, 7664, by Oxford Duke, 3445, etc.
2. Ellerys & Stevens, Salford, (Jersey) Dewdrop ; farrowed Sept. 28th, 1892. Bred by exhibitors ; sire, Roger, 2259 ; dam, Aunt Vira, 7664, by Oxford Duke, 3445, etc.
3. John Bell, Amber, (Tamworth), Amber Duchess—110 — ; farrowed August 1st, 1892. Bred by exhibitor ; sire, Ingersoll Duke (imp.)—12— ; dam, Alice —66—, by Norman's Pride (imp.) —1— (2207), etc.

Sec. 4.—Sow, nine months and under.

1st prize $10, 2nd $6, 3rd $4.

1. Ellerys & Stevens, Salford, (Jersey) Molly ; farrowed May 21st, 1893. Bred by exhibitors ; sire, Roger, 2259 ; dam, Aunt Vira, 7664, by Oxford Duke, 3445, etc.
2. John Bell, Amber, (Tamworth) Molly —71 — ; farrowed April 16th, 1893. Bred by exhibitor ; sire, Norman's Pride (imp.) —1— (2207) ; dam, Sally Ann (imp.) —1— (3908), by Curly (633), etc.
3. Thos. George, Mount Elgin, (Tamworth) Red Skin —106 — ; farrowed June 17th, 1893. Bred by exhibitor ; sire, Short Nose (imp.) —88 — ; dam, Countess II. (imp.) —105—, by Gun Hill Prince (1591), etc.
4. John Bell, Amber, (Tamworth) Allie II., —109—, farrowed April 7th, 1893. Bred by exhibitor ; sire; Coleshill Hero (imp.) —31— ; dam, Alice —66—, by Norman's Pride (imp.) —1— (2207), etc.

Sec. 5.—Three pigs, the offspring of one sow. Bred by exhibitor.

1st prize $20, 2nd $15, 3rd $7.

1. Isaac Holland, Avon, (Tamworth) :
   Tom —86—. (See above).
   Bob —87—. "
   Nora —104—. "

2. Ellerys & Stevens, Salford, (Jersey) :
   Mayflower. (See above).
   Dewdrop. "
   Molly. "

3. Thos. George, Mount Elgin, (Tamworth) :
   Samba —89—.
   Gladstone —90.—
   Red Skin —106—.

4. John Bell, Amber, (Tamworth) :
   Amber Sally —112—.
   Sally Jane —70—.
   Molly —71—.

CLASS XVII.—SUFFOLK, ESSEX, VICTORIA, etc.

Sec. 1.—Barrow, nine months and under.

1st prize $10, 2nd $6, 3rd $4.

1. R. Dorsey, Burnhamthorpe, (Suffolk) Dick —172— ; farrowed March 14th, 1893. Bred by exhibitor ; sire, Caledon Lad —155— ; dam, Caledon Girl —152—, by Lamfirst —147—, etc.
2. R. Dorsey, Burnhamthorpe, (Suffolk) Charlie —173— ; farrowed March 14th, 1893. Bred by exhibitor ; sire, Caledon Lad —155— ; dam Caledon Girl —152—, by Lamfirst —147—, etc.

Sec. 2.—Sow, over nine months and under eighteen.

1st prize $12, 2nd $8, 3rd $4.

1. Jos. Featherstone, Streetsville, (Suffolk) Minnie B —167— ; farrowed Oct. 10th, 1892. Bred by exhibitor ; sire, Ben IV. —149— ; dam, White Flower —118—, by Wanderer —87—, etc.
2. R. Dorsey, Burnhamthorpe, (Suffolk) Milton Lass —153— ; farrowed Sept. 11th, 1892. Bred by Wm. Elliott, Milton, Ont ; sire, Milton Boy —146— ; dam, Sister to Nettie —147—, by Pugilist —77—, etc.
3. R. Dorsey, Burnhamthorpe, (Suffolk) Betty —166— ; farrowed Sept. 11th, 1892. Bred by Wm. Elliott, Milton, Ont ; sire, Milton Boy —146— ; dam, Sister to Nettie —147—, by Pugilist —77—, etc.
4. A. Frank & Sons, The Grange, (Suffolk) Purple —179— ; farrowed Oct. 14th, 1892. Bred by exhibitors ; sire, Lamfirst —147— ; dam, Nancy —156—, by Lamfirst —147—, etc.

Sec. 3.—Sow, over nine months and under.

1st prize $10, 2nd $6, 3rd $4.

1. Jos. Featherstone, Streetsville, (Suffolk) Carnaba —184— ; farrowed April 4th, 1893. Bred by exhibitor ; sire, Prince George —121— ; dam, Carnaba —119—, by Wanderer —87—, etc.
2. R. Dorsey, Burnhamthorpe, (Suffolk) Ettie —177— ; farrowed March 14th, 1893. Bred by exhibitor ; sire, Caledon Lad —155— ; dam, Caledon Girl —152—, by Lamfirst —147—, etc.
3. A. Frank & Sons, The Grange, (Suffolk) Blue —180— ; farrowed April 12th, 1893. Bred by exhibitors ; sire, Lamfirst —147— ; dam, Nancy —156—, by Lamfirst —147—, etc.
4. A. Frank & Sons, The Grange, Suffolk) Grey —182— ; farrowed May 12th, 1893. Bred by exhibitors ; sire, Lamfirst —147— ; dam, Pansy —154—, by Lamfirst —147—, etc.

Sec. 5.—Three Pigs (the offspring of one sow). Bred by exhibitor.

1st prize $20, 2nd $15, 3rd $7.

1. R. Dorsey, Burnhamthorpe, (Suffolk) :
   Ettie —177—. (See above).
   Dick —172— "
   Charlie —173— "

2. A. Frank & Sons, The Grange, (Suffolk) :
   Green —181—. (See above),
   Grey —182—. "
   Brown —183—. "

3. A. Frank & Sons, The Grange, (Suffolk) :
   White —178—. (See above).
   Purple —179—. "
   Blue —180— "

Barrow, any age or breed.

1st prize $15.

1. J. C. Snell & Bro., Edmonton, Sim —2691— ; farrowed Oct. 23rd, 1892. Bred by exhibitors ; sire, Enterprise (imp.) —1378— ; dam, Savernake's Daughter (imp.) —1919—, by Ramdon (1348), etc.

Sow, any age or breed.

1. George Green, Fairview, (Berkshire) Maid of Omen —2004— ; farrowed Sept. 18th, 1889. Bred by S. J. Read, Mount Brydges, Ont ; sire, Lord Carlisle II. —870— ; dam, Lady Bond —861—, by Knight of Gloster II —206—, etc.

CLASS XVIII.—GRADE.

Sec. 1.—Barrow, over nine months and under eighteen.

1st prize $12, 2nd $8, 3rd $4.

1. John Bell, Amber, Aleck.
2. Geo. Green, Fairview, Champion.

Sec. 2.—Barrow, nine months and under.

1st prize $12, 2nd $8, 3rd $4.

1. Albert Barber, Guelph, Teddy Gardner.
2. Jas. Goodger, Walmer, Samson.
3. Albert Barber, Guelph, Aberdeen.
4. Jas. Goodger, Walmer, Blucher.

Sec. 3.—Sow, over nine months and under eighteen.

1st prize $12, 2nd $8, 3rd $4.

1. Chas. Austin, Mosboro', Jess.
2. D. G. Hanmer & Son, Mt. Vernon, Sue.
3. H. George & Sons, Crampton, Minnie.

Sec. 4.—Sow, nine months and under.

1st prize $12, 2nd $8, 3rd $4.

1. Albert Barber, Guelph, Elizabeth.
2. Jas. Goodger, Walmer, Bessie.
3. Albert Barber, Guelph, Charlotte.
4. Chas Austin, Mosboro', Dick.

CLASS XIX.—GRADE.

Sec. 1.—Hog, any age, breed or sex.

Silver Medal.

1. Chas. Austin, Mosboro', Tom.

Pair of Pigs (grade or pure bred) under nine months, suitable for the export trade.

Special prize given by J. L. Grant & Co., Ingersoll.

1. John Bell, Amber, (Grade), Berkshire and Tamworth, Charles and William.

POULTRY.

CLASS XX.—DRESSED POULTRY.

Judge.—George Murton, Guelph.

1. Best pair turkey cockerels or pullets, hatched 1893.	James Bowman, Guelph		$6 00
2nd " " "	C. Darby, Gourock		4 00
3rd " " "	Geo. Fyfe, Gourock		2 00
2. Best dressed turkey, 1893.	Jas. Scott, Aberfoyle		6 00
2nd "	Geo. Fyfe, Gourock		4 00
3rd "	W. John Rutherford, Roseville		2 00
3. Best pair of ganders or geese, hatched 1893.	Robt. Buchanan, Gourock		6 00
2nd " " "	J. R. Caldwell, Fergus		4 00
3rd " " "	J. R. Caldwell, Fergus		2 00
4. Best pair drakes or ducks, hatched 1893.	Alf. Hales, Guelph		6 00
2nd " " "			4 00
3rd " " "			2 00
5. Best pair fowl cockerels, hatched 1893.	Stewart Bros., Everton		6 00
2nd " "	Mrs M. P. Card, Guelph		4 00
3rd " "	J. Miller, Guelph		2 00
6. Best pair pullets, hatched 1893.	Stewart Bros., Everton		6 00
2nd "	Geo. Fyfe, Gourock		4 00
3rd "	Mrs. M. P. Card, Guelph		2 00
7. Largest and best turkey, any age.	Geo. Fyfe, Gourock		5 00
8. Best display of poultry, hatched 1893.	Jas. Anderson, Guelph		6 00
2nd " "	Mrs. John Rutherford, Roseville		4 00
3rd " "	Jas. Bowman, Guelph		2 00
9. Best collection of undressed poultry.	Geo. Fyfe, Gourock		6 00
2nd " "	Jas. Bowman, Guelph		4 00
3rd " "	A. A. Armstrong, Fergus		2 00

ONTARIO VETERINARY COLLEGE.

Few educational institutions in America enjoy such a widespread reputation as the Ontario Veterinary College, of Toronto. Certainly no other institution in Canada attracts so many students from the United States. Started in a very humble way by Dr. Andrew Smith, it has been developed into the largest and most thoroughly equipped veterinary college on the continent. The hundreds of students who attended during the session which has just closed represented every province of the Dominion and every state in the Union.

The closing exercises of the session of 1892-3 were held in the large lecture hall in the college buildings, Temperance street, on March 24th, 1893. Besides the students and their friends, the following visitors occupied seats on the platform: His Honor Lieutenant-Governor Kirkpatrick; Sir Casimir Gzowski; D. R. Wilkie, President of the Board of Trade; Hon. John Dryden, Minister of Agriculture; J. J. Withrow, President of the Industrial Exhibition Association; James L. Hughes, Inspector of Public Schools; Dr. G. S. Ryerson, M.P.P.; G. B. Smith, M.P.P.; Mayor Lloyd, of Newmarket; William Cowan, V.S., Galt; J. D. O'Neil, V.S., London; John Akers.

Dr. Andrew Smith, Principal of the college, presided, and after the long list of graduates and prize winners had been read he requested the Lieutenant-Governor to address a few words to the students. As usual, His Honor, made a very happy speech. He congratulated the college on its flourishing condition and was glad to see so many American students in attendance. Happily, no tariff prevented their coming to Canada to study, and he trusted that the friendships made at the college would not cease when they returned to their homes. The importance of veterinary science could hardly be exaggerated, and he was confident that the scores of young men who were now leaving with their diplomas were thoroughly competent to undertake the work. He wished them every success in life.

Hon. John Dryden was next called upon. Canada, he thought, might well be proud of the army of graduates who were now leaving the college. The study of veterinary science directly benefited the farming industry, and Canada was indeed fortunate in possessing such a splendid institution as the Ontario Veterinary College. He congratulated the management on the success of the institution and wished it continued prosperity.

Dr. Ryerson, M.P.P., also spoke briefly and appropriately. He referred to the great value of a knowledge of veterinary science. The care and treatment of dumb animals was indeed a noble work.

Short addresses were also delivered by Sir Casimir Gzowski, James L. Hughes, D. R. Wilkie, G. B. Smith, M.P.P., and J. J. Withrow. The prizes, very beautiful and useful ones, were then presented to the winners by the Lieutenant-Governor and the other distinguished visitors. H. D. Martin, V. S., of Buffalo, presented Dr. Smith with the large and beautifully framed graduating class picture.

LIST OF GRADUATES.

Graduated March 24th, 1893.

The following is a complete list of the graduates of the Ontario Veterinary College for the session 1892-3.

Abele, Francis, Jr.....Boston, Mass.
Adams, A. M .....Canal Dover, Ohio.
Adams, Charles H.....Stouffville, Ont.
Adams, William E.....Stouffville, Ont.
Airth, James .....Port Elgin, Ont.
Alexander, Albert E.....Strathroy, Ont.
Anderson, L. A.....Cincinnati, Ohio.
Armstrong, John .....Locust Hill, Ont.

Baker, Albert C..... Courtland, N.Y.
Barnes, Robert .....Poplar Hill, Ont.
Barth, William C ..... Leavenworth Kansas.
Boyles, John M .....Mongolia, Ont.
Beath, James .....Columbus, Ont.
Bertron, F. M .....Canisteo, N.Y.
Biehn, Oscar, Jr.....Coopersburg, Pa.
Blatchford, Frank M .....New Hamburg, Ont.
Bowman, Albert T .....Canton, Ohio.
Brooks, James L .....Fingal, Ont.
Brumter, Edward W.....Wooster, Ohio.
Bryant, Albert .....Lucan, Ont.

Campbell, Robert Finlay....Whitby, Ont.
Casey, Eugene M .....New Milford, Pa.
Cassels, Fred H .....Tacoma, Wash.
Cassels, Robert .....Wingham, Ont.
Christian, George R .....Glenne Valley, Ind.
Coleman, William F.....Toronto, Ont.
Collins, Robert E .. ..Lovelton, Pa.
Coote, Henry L. B .....Minnedosa, Man.
Culbertson, C. M ..... Durham, Ont.

Davidson, William .....Harriston, Ont.
Derr, William H .....Wooster, Ohio.
Deyell, James D.....South Monaghan, Ont.
Dillahunt, P. A .....Springfield, Ohio.
Domville, Henry .....St. John, N.B.
Dooling, Eugene E .....Syracuse, N.Y.
Dunlap, George W .....Goodville, Pa.

Eakin, Nelson D. R .....Toronto, Ont.
Emery, Edwin W .....Maumee, O.
Evans, Fred.....Avoca, Neb.
Ewart, Albert C.....Wyoming, Ont.

Fenn, Harry V .....Colchester, Eng.
Filsinger, John A .....Syracuse, N.Y.
Fisher, Duncan .....Grandin, N. Dakota.
Foran, Michael J .....Auburn, N.Y.
Frederick, Charles B ..... Freeburg, O.
Freeman, Frank E .....Belfast, Me.

Gibson, George D .....Brandon, Man.
Gohn, Horace M .....Thornhill, Ont.
Graham, William T .....Door Village, Ind.
Grayson, Frank C.....Paxton, Ill.

Harrison, Philip.....Bad Axe, Mich.
Harrison William .....Bad Axe, Mich.
Hatton, John .....Glenboro, Man.
Herrington, E M .....Picton, Ont.
Hinkley, Charles J .....Odebolt, Iowa.
Holley, Charles W .....Ralston, Pa.
Hopkins, E. J..... ...Newboro, Ont.
Howell, George .....Vernon, Ont.
Humphrey Arthur M ..... Darien Centre, N.Y.
Humphrey, Edwin H .....Remington, Ohio.

Ilsley, Buoy R ....Weymouth, N.S.

Jelly, Richard J. .....Mossley, Ont.

Kalb, Edward L .... Rochester, Minn.
Kellam, Milton J ..... Rainham Centre, Ont.
Kellogg, Daniel M .... Reynoldsville, N.Y.
Kennedy, Henry F ....West Union, Iowa.
Kerr, William H .. ..Urbano, Ohio.
Kime, Joseph, Jr ....Chatham, Ont.
Kohler, Daniel R ....Kultztown, Pa.
Kolbe, Karl H .....Napoleon, Ohio.

Lathrop, Virgil ..... Albany, N.Y.
Lawton, F. E .....Paris, Ill.
Leist, Charles E .....Circlevllle, Ohio.
Lemon, John P .....Cresco, Iowa.
Linscott, Frank M .....Holton, Kansas.
Longacre, Edwin D .....Longacre, Pa.

McAndless, Charles B .. Ilderton, Ont.
McBride, W. J. H.....Amherstburg, Ont.
McCluskey, George .....Orangeville, Ont.
McGillicuddy, James .....Watford, Ont.
McGregor, James F . .....Delaware, Ont.
McKay, Alex. M .....Morewood, Ont.
McKellar Alex. H.....Washburn, Iowa, U.S.
McKercher, Arthur .....Petrolea, Ont.
McLain, Ellis .....Nanticoke, Ont.
McMaster, John A .....Guelph, Cnt.

Madden, Harry T .....Greenfield, Ill., U.S.
Madill, R. H ....Streetsville, Ont.
Mahorney, D. M .....Ladoga, Ind.
Manser, George C .....Linwood, Ont.
Marbes, John H.....Syracuse, N.Y., U.S.
Martin, Harry Delos . .....Buffalo, N.Y., U.S.
Mather, John William.....Rohrsburg, Pa., U.S.
Medd, W. H. B .....Larchwood, Iowa, U.S.
Mettlen, J. Harvey .....Wakefield, Neb., U.S.
Miller, Chester ....Ottumwa, Iowa, U.S.
Moore, Albert W .....Charlevoix, Mich. U.S.
Moore, L. G .....Trenton, N.Y., U.S.
Morgan, W. J .....Kingston, Ont.
Munro, Bruce D .....Whitehall, Pa., U.S.
Murray, Thomas H .....Medo, Minn., U.S.

Orme, Thomas W .....London, Ont.
Orr, James W.....New Hamburg, Ont.

Packwood, Thos.....Goderich, Ont.
Parker, Charles E .....Dexter, Mich.
Pattison, John M ..... Bentonville, Ind.
Perkins, Romanzo.....Hardys, N.Y.
Post, Harry H .....Melville, Ont.
Price, Edwin L .....Reynoldsburg, Ohio.

Rhodes, C. K .. ..Broadway, Va.
Rose, H. A ....Selkirk, Ont.
Ruby, Isaac A.....North Liberty, Ohio.

Salisbury, William H .....Phelps, N.Y.
Sands, Harry G ....Welliversville, Pa.
Seller, Daniel E.....Minden City, Mich.
Shirley, Albert G ..... Watford Ont.
Shoebottom, Elvin E . .... Lucknow, Ont.
Showalter, G. D.....Broadway, Va.
Sigmond, Charles J .....Minneapolis, Minn.
Smith, Septimus Marshall .Moosomin, N.W.T.
Spence, Andrew.....Emerson, Man.
Steers, K. Oliver .....Midland, Ont.
Stover, John P.....Shady Grove, Pa.
Sweeley Elmer E .....Warrensville, Pa.

GRADUATES.—*Continued.*

Sweet, Thomas J ..... Morden, Man.
Switzer, William B ..... Williamson, N.Y.

Tower, H. Linwood ..... North Adams, Mass.
Turner, John B ..... Butler, Ill.
Tweedley, Alexander S ..... Buffalo, N.Y.

Van Es, Leunis ..... Seward, Neb.
Verschelden, Oscar ..... St. Mary's, Kansas.

Walcott, Jacob E ..... Napoleon, Ohio.
Walcott, William H ..... Napoleon, Ohio.
Waldon, Thomas ..... Gore's Landing, Ont.
Washburn, William Bert ..... Richfield Centre, Ohio
Watson, Thomas E ..... Nelson, Ont.
Weld, Henry J ..... Delaware, Ont.
Welliver, George Howard ..... Bloomsburg, Pa.
Whitling, T. Townsend ..... Island Lake, Minn.
Wilkins, Edward ..... Camden, N.J.
Wilson, Maurice E ..... Estherville, Iowa.
Wootton, E. A ..... Wellman's Corners, Ont.

Yoder, Edwin C ..... Kutztown, Pa.
Young, George J ..... Marshallton, Pa.
Yule, Charles C ..... Weston, Ohio.

GRADUATED DEC. 20TH, 1893.

Drinkwater, Irvin W ..... Rochester, N.Y.

Flood, Thomas ..... Stanley, N.Y.

Graham, Thomas A ..... Claremont.

Hassard, F. J ..... Caledon, East.
Hedges, Charles V ..... Circleville, Ohio.

Kuhl, Mathias H ..... Neenah, Wis.

Longenecker, William ..... Lititz, Pa.

McFarlane, Walter Scott ..... Niagara Falls, N.Y.

Meld, J. H ..... Auburn

Moore, M. H ..... Listowel.
Moyer, Samuel Emery ..... Easton, Pa.

Nockolds, Coleman ..... Abeline, Texas.
Nunn, Henry ..... Bolton.

Perley, Herbert S ..... Ottawa.

Raymond, Argo ..... Tilsonburg
Redhead, William ..... Corning, Iowa

Stein, Howard L ..... Kutztown, Pa
Stewart, George R ..... Arkona.

Telfer, W. B ..... Lowville.

TREASURER'S REPORT FOR 1893.

GEORGE GRAHAM, Treasurer, in account with the Agriculture and Arts Association for the year ending December 31, 1893.

RECEIPTS.

	$ c.	$ c.
Balance from 1892		2,444 16
Refund from Mail Job Printing Co		12 60
Registration fees		2,752 25
Herd Books sold		114 30
Clydesdale Books		99 55
Swine Records		307 58
Spring Horse Show:		
Entry fees	106 00	
Gate receipts	296 80	
Catalogues sold	38 50	
Hackney Association	20 00	
Shire Association	20 00	
Clydesdale Association	540 00	
		1,021 30
Rentals:		
P. Jamieson	2,000 00	
Rent of office	5 00	
		2,005 00
Legislative grant		5,800 00
Interest on Prince of Wales' mortgage		56 00
From Joshua Legge for medals		9 00
Fat Stock Show:		
Entry fees	386 25	
Gate receipts	177 45	
Catalogues sold	3 00	
Grant & Co., special prize	25 00	
Sheep Breeders' Association	480 00	
Swine " Association	448 00	
		1,519 70
Total receipts		16,141 44

DISBURSEMENTS.

	$ c.	$ c.
Fat Stock Show:		
Prizes	2,104 00	
Ribbons	39 70	
Judges	37 25	
Printing and advertising	126 60	
Superintendent	16 00	
Gate keepers	19 00	
Watchman	5 00	
Telegrams and postage	3 73	
Express	1 55	
Travelling and hotel expenses	32 00	
		2,384 83
Building expenses:		
Out. Government for heating	200 00	
P. Jamieson for heating	20 00	
Water rates	15 00	
Taxes	88 30	
		323 30

	$ c.	$ c.
DISBURSEMENTS.—*Continued.*		
Veterinary College expenses:		
Diplomas for students	120 00	
Tubes for diplomas	1 55	
Medals	15 00	
		136 55
Building repairs:		
Papering hall	41 00	
Galvanized iron work	89 25	
Plastering	12 30	
Sundry persons	38 19	
		180 74
Insurance		98 75
Library books and city directory		21 75
Interest on Miss Loughrin's mortgage		600 00
Plowing matches:		
Prizes per W. J. Westington	150 00	
" Robert McEwen	150 00	
" Nicholas Awrey	150 00	
" Jonathan Sissons	150 00	
H. Wade, travelling expenses to Hamilton	5 40	
		605 40
Members' fees:		
Board meetings (3)	567 88	
Stock Show committees	133 64	
		701 52
Delegates to World's Fair:		
J. C. Rykert	74 60	
James Rowand	33 00	
		107 60
Legal expenses *re* lease of store		20 00
F. W. Hodson *re* prize farms		30 00
Herd Books:		
Mail Job Printing Co	15 00	
Hunter, Rose & Co., binding	50 00	
Daniel Rose, Swine Records	517 43	
Hunter, Rose & Co., Clydesdale Book	643 10	
		1,225 53
Spring Horse Show:		
Prizes	1,770 00	
Ribbons	15 85	
Judges	55 50	
Printing and advertising	286 45	
Attendants	56 30	
Expenses of committee	64 08	
Sundries	18 20	
		2,266 38
Printing and stationery		280 50
Postage		340 80

TREASURER'S REPORT FOR 1893.—*Continued.*

DISBURSEMENTS.—*Continued.*

	$ c.	$ c.
Salaries:		
Henry Wade, Secretary ...	1,500 00	
A. S. McVity, Clerk	600 00	
J. W. Nimmo, Stenographer	475 00	
George Graham, Treasurer.	125 00	
Hobson & Dickie, Auditors.	30 00	
Messenger and caretaker ...	218 00	
		2,948 00
Office expenses:		
Rent of telephone	42 18	
Gas	12 83	
Sundry supplies...	21 93	
		76 94
Miscellaneous		83 15
Total disbursements		12,431 83
Balance on hand.....		3,709 61

ASSETS.

	$ c.	$ c.
Cash on hand	3,958 36	
Less outstanding cheques.....	248 75	3,709 61
Real estate		60,000 00
Library		1,500 00
Prince of Wales' fund...		800 00
Furniture and safe		600 00
Clydesdale, Ayrshire and Swine Breeder's Herd Books		2,700 00
		69,209 61

LIABILITIES.

Mortgage on real estate	10,000 00

GENTLEMEN,—We, your Auditors, beg leave to report that we have examined the Treasurer's books and accounts and find vouchers for the disbursements correct, showing a balance in the Treasurer's hands deposited in the bank to the credit of the Association of $3,958.36 on December 31st, 1893. All of which is respectfully submitted.

JOHN I. HOBSON, WM. DICKIE, } Auditors.

ANNUAL REPORTS

OF THE

Poultry and Pet Stock Associations

OF THE

PROVINCE OF ONTARIO

1893.

PRINTED BY ORDER OF THE LEGISLATIVE ASSEMELY.

TORONTO:
PRINTED BY WARWICK BROS. & RUTTER, 68 AND 70 FRONT STREET WEST.
1894.

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Embden Gander 77

LIST OF MEMBERS

FOR 1894.

Name.	Post Office.	Breeds.
Axford, John	St. Thomas	Plymouth Rocks and Indian Games.
Bogue, Allen	London	Cochins, Hamburgs, Dorkings, Houdans, Polands; Geese and Ducks.
Barber, Wm. & Co	Toronto	Games and Game Bantams.
Bender, Hiram	Niagara Falls	Plymouth Rocks.
Bogue, George	Strathroy	Plymouth Rocks, Langshans, Wyandottes and Dominiques.
Bell, W. J	Anglin	White Leghorns and Bronze Turkeys.
Bauleh, J. H.	Port Hope	Trumpeter Pigeons.
Bennett, J. E.	Toronto	Barred Plymouth Rocks.
Burroughs, Robert	Toronto	Pigeons.
Brown, James	Toronto	White Rocks and Hamburgs.
Benson, C. S.	Toronto	Bantams, Cochins and Langshans.
Backe, Judson	Brantford	
Burn, M. T.	Tilsonburg	
Crowe, John	Guelph	Games.
Crowe, Chas	Guelph	Game Bantams.
Cale, E. B.	Stratford	White Wyandottes, Black Javas, Spanish and Bantams.
Colson, John	Guelph	White Plymouth Rocks, Pekin Ducks and Black Javas.
Cole, John & Co	Hamilton	Light Brahmas and Langshans.
Coon, William	Guelph	Javas.
Clams, S. M	Galt	Leghorns, Minorcas and Wyandottes.
Cameron, John	Galt	Light Brahmas.
Chamberlain, G. A.	Guelph	
Daniels, C. J.	Toronto	Plymouth Rocks, Games, Red Caps, Bantams, Wyandottes, Leghorns and Javas.
Donovan, H. E.	Toronto	Bantams and Pigeons and Pets.
Dustan, W. H.	Bowmanville	Andalusians.
Dunn, Geo.	Wyndham	Canaries and Birds.
Donnelly, E. H.	Sandwich	Light Brahmas and Plymouth Rocks.
Daniels, J. A	Haysville	Black Leghorns.
Duff, Thos. A.	Toronto	Barred Plymouth Rocks, Langshans, Silver Wyandottes and Games.
Dilworth, Joseph	Toronto	
Emerick, Henry	International Bridge	Hamburgs and Spanish.
Ernst, Chas.	New Hamburg	
Fox, Wm.	Toronto	Rabbits, all kinds.
Fraser, Alex.	New Hamburg	Black Spanish.
Franks Ernst	New Hamburg	Brown Leghorns.
Fox, J. C.	New Hamburg	
Gibbs, Adam	Exeter	Silver Wyandottes.
Glesser, G.	New Hamburg	Silver Wyandottes.
Grayersbill, J. M	Guelph	Wyandottes and Langshans.
Goetel, Fred	New Hamburg	Black Langshans.
Graff, Geo. F	New Hamburg	White Leghorns.
Graham, W. R	Guelph	
Grills, Geo. H	Belleville	
Hennels, H. M.	New Hamburg	Black Javas and Canaries.
Hare, F. C.	Whitby	Buff Cochins and Black Spanish.
Hodgson, R. H.	Brampton	Barred Plymouth Rocks.
Hayenek & Kent	Kingsville	Light Brahmas, Plymouth Rocks, Games, Langshans, Wyandottes, Minorcas and Red Caps.
Hamilton, J. L.	Hamilton	Bantams and Game Bantams.
Hindson, H. J	Preston	Games, B. B. Red

LIST OF MEMBERS.—*Continued.*

Name.	Post Office.	Breeds.
Howe, A.	Toronto	Light Brahmas.
Haycock, Wm.	Kingston	
Hodson, F. W.	London	
James, W. J.	St. Thomas	Games, B. B. Red.
Knight, W. R	Bowmanville	Andalusians, Black Javas, Houdans, and Rouen Ducks.
Keiley, T. J.	London	White R. C. Leghorns.
Kratzenmeier, J. K.	New Hamburg	Silver Wyandottes.
Laird, J. A.	Brampton	S. White Leghorns.
Lovegrove, J.	St. George	Leghorns and Houdans.
Langdon, Wm.	Port Hope	
Meyer, J. E.	Kossuth	Silver Wyandottes.
Margach, J. L.	Port Hope	Silver Wyandottes and Brown Leghorns.
Main, Wm.	Milton	Dorkings, Games, Turkeys, Ducks and Geese.
Morris, Jas.	Guelph	
Munro, J. S.	Goderich	Black Hamburg and Spanish.
Massie, Chas.	Port Hope	
McCormick, Geo. G.	London	White Wyandottes, Black Javas, Buff and Black Cochins.
McNeil, William	London	Polands, Bantams, Cochins, Hamburgs and La Fleche.
McKee, Jas H.	Norwich	Plymouth Rocks and Ducks.
McCurdy, Robt.	London	Langshans and Black Minorcas.
McLoud, William	London	Game Bantams, Black Spanish, Games and Plymouth Rocks.
McMeans, Alex.	Brantford	White Cochins.
McGrattan, T.	Toronto	
McDonald, Robt.	Guelph	
Niven, Dr. J. S.	London	Red Caps and Pheasants.
Oke, Richard	London	Cochins, Hamburgs, La Fleche, Bantams and Creve Coeurs.
Oldrieve & Nicol	Kingston	Games and Game Bantams.
Pequegnat, L. G.	New Hamburg	Partridge, Cochins, Plymouth Rocks, Leghorns and Pekin Bantams.
Puddicomb, R. B.	New Hamburg	Barred Plymouth Rocks and Black Leghorns.
Pletsch, John	Shakespeare	White and Brown Leghorns.
Pequegnat & Chamberlain	New Hamburg	Part Cochin and Minorca.
Philpot, James	Guelph	
Rice, Thos.	Whitby	Plymouth Rocks, Black Minorcas, S. White and Brown Leghorns.
Readwin, W. H.	Guelph	Javas, Houdans, and Pigeons.
Reid, W. H.	Kingston	Plymouth Rocks, Leghorns and Dorkings.
Rowlin, S. H.	Hamilton	Red Caps.
Stockwell, C.	London	Andalusians and Houdans.
Scott, T. H.	St. Thomas	Golden Wyandottes.
Somerville, Thos.	Haysville	Turkeys (Bronze).
Sterling, T. H.	New Hamburg	
Saunders, J. H.	London	Brahmas and Brown Leghorns.
Smith, G. D.	Preston	Cochins and Langshans.
Senior, Thos. J.	Hamilton	Minorcas and Indian Game.
Schuler, John	New Hamburg	Black Leghorns.
Thorpe & Scott	London	Dark Brahmas.
Thornton, C. H.	St. Thomas	Indian Game.
Trew, D. C.	Lindsay	Houdans and White Leghorns.
Tyson, A. W.	Guelph	
Tyson, W. H.	Berlin	
Webber & Robertson	Guelph	Black Wyandottes and Pekin Ducks.
Wallace, H. H.	Woodstock	White Plymouth Rocks and Aylesbury Ducks.
Winn, R. T.	New Hamburg	Parrots.
Wood, C. W.	Toronto	Black Minorcas.
Wagner, C. F.	Mimico	Wyandottes, Leghorns, Minorcas and Pigeons.

ANNUAL REPORT

OF THE

POULTRY ASSOCIATION OF ONTARIO.

ANNUAL MEETING.

The Annual Meeting of the Ontario Poultry Association was held in the town hall, New Hamburg, on January 4th, 1894.

The President, Mr. L. G. Pequegnat, occupied the chair, and the meeting was called to order at 2 o'clock p.m.

PRESIDENTS ADDRESS.

It is with great pleasure that I welcome you to our Annual Meeting. I am glad that so many from outside points should have thought our town worthy of a visit on this occasion. It is not necessary for me to tell you that this is the greatest show the Association has ever held since its organization twenty years ago. We have, perhaps superior birds here to what were sent to the World's Fair, and if we were exhibiting them there to day we could make even a better showing than we have done.

The minutes of the previous Annual Meeting, and also of the board meetings held since were read and adopted.

COMMUNICATIONS.

Letters were read from Mr. Duff and Mr. Livingstone, M.P., expressing regret at not being able to attend the meeting.

The Secretary in reading the following extract from a letter from one of the exhibitors said it was not necessary to mention names, as it was only one of many of like import, viz: "Would you kindly change my entry for me. The Brown Plymouth Rock cock I entered is sick, and I send a hen, and instead of the cockerel I send two pullets. The Black Minorca pullet met with an accident, so I forward a White Wyandotte hen in her place." The Secretary stated that such corrections or any after the date of closing entries was simply out of the question, and asked that the meeting so decide. It was decided to discuss the matter later.

A communication was read from the Port Hope Poultry and Pet Stock Association, requesting that the next Annual Meeting be held in that town.

THE SECRETARY'S REPORT.

I am proud to be in a position to extend to you my hearty congratulations on the success which has attended the united efforts of the New Hamburg committee and the Directors of this Association in making this year's show the most successful ever held under our auspices.

The number of the specimens on exhibition is the largest ever shown at the "Ontario," exceeding the record of 1893 by about 60, and making a grand total of 1,354 entries for this year.

The quality of the birds, in the expressed opinion of many of the experts present, excels that of former years, which reflects great credit on the breeders of Ontario for their care and perseverance in promoting the poultry industry.

The expense of management will be considerably less in New Hamburg than at Hamilton last year, and this, together with the additional amount received from entry fees will enable us to increase the small balance to our credit at the beginning of the year. Be this as it may, it is necessary for us in our deliberations this afternoon to remember that should additional expense be created in any of the departments there must be a corresponding revenue provided.

We must not lose sight of the fact that it is not finances that should be the main object of this Association, but rather the imparting useful and instructive information. I thank you, gentlemen, for the hearing you have given me and trust our meeting together may be a benefit to all present.

T. A. Browne.

THE TREASURER'S REPORT.

The following report of the Treasurer was then read and adopted :

Financial Statement for the Year Ending December 31st, 1893.

Receipts.

To balance on hand from last year	$ 151 69
" Legislative grant	900 00
" Members' subscriptions	117 00
" Donations	127 25
" Fees to exhibition	598 75
" Bank interest	45
Total receipts	$1,895 14

Expenditures.

Prizes at last exhibition	$ 1,196 75
" awarded in 1889	40 00
Rent, lighting, fitting up, etc., of buildings and grounds	93 59
Working expenses	61 97
Services of Secretary	100 00
" Assistants	85 64
" Judges	120 00
Miscellaneous : advertising, $110.50 ; discount note, $25.50	136 00
Balance on hand	61 19
	$1,895 14

G. G. McCormick.

ELECTION OF OFFICERS.

The following gentlemen were elected officers of the Association for the ensuing year :

President : Mr. C. Ernst, New Hamburg.

1st Vice-President : Mr. A. Bogue, London.

2nd Vice-President Mr. G. S Oldmeve, Kingston.

Treasurer : Mr. G. G. McCormick, London.

Auditors : Mr. H. B. Donovan, Toronto. Thos. A. Duff, Toronto.

Permanent Secretary Thomas A. Browne, London.

Delegates to Fair Boards : Toronto Industrial, Messrs. Duff and Barber. Western Fair, London, Messrs. Saunders and McCormick.

Directors : Messrs. McNeil, Kent, Burn, Gorbel, Barber, Cole, Rice, Trew, Colson.

PLACE OF HOLDING NEXT ANNUAL CONVENTION.

Mr. Bogue : I take pleasure in moving that the next Annual Exhibition be held in the town of Port Hope. I know that the eastern people have always felt that there was an injustice done them in not holding this exhibition east of Toronto. I think that as a matter of fairness the Association should vote in favor of Port Hope.

Mr. McCormick : I am a Western man, and would personally prefer to see the show go to London, but I think it only fair and just that it should go east sometimes. I believe it has been held east of Toronto only twice in twenty years. We certainly have about two-thirds of the population of the province in the west, but I do not think that is any reason why we should keep the show. I take great pleasure in seconding the motion.

Mr. Peine : We have heard it stated to-day that the show is the best the Association has ever held. There must be some cause for this. You all know that New Hamburg has held the best local show of any place in Ontario. Last year we had 1,008 entries. When the show was held in Bowmanville, the Bowmanville people contended that they had lost money by it, and were allowed to have it a second year. We are in a similar position here. We granted $160 for expenses and we have spent $150 in coops alone, and are now out of pocket.

Mr McQuillan : I would rather see the show held here perhaps than any other place, but the argument used by Mr. Peine is the very best argument why the show should go east of Toronto. In this section you are already educated, and have, perhaps, the finest poultry in Canada. In the east and extreme west they require education along this line. When they once become enthusiastic on the subject they will go to the show no matter where it is held. Then the understanding was, I believe, that if New Hamburg got the show this year they would not ask for it again.

Mr. Trew : I went to Port Hope last year and never saw a better show in my life. There is good accommodation and it is easy of access. It was well conducted, and the prize money was paid to every man before he left the show.

Mr. Haycock : I am informed that there is a resolution in the minutes stating that a show shall not be held in the same place for two years in succession.

The Secretary : I am not able to find any such resolution in the minute book.

Mr. Langford : If you will send the show to Port Hope, I am confident we can raise from $100 to $150 in cash and our town council is prepared to stand by us to the extent of $200.

The vote was then taken, and on the second ballot, after Guelph had dropped out, New Hamburg obtained a plurality of the votes over Port Hope. It was moved by Mr. McNeil, seconded by Mr. Burn, —That New Hamburg be made the unanimous choice of the meeting as the place for holding the next annual show. Carried.

ADDRESS BY HON. JOHN DRYDEN, MINISTER OF AGRICULTURE.

Hon. John Dryden, Minister of Agriculture, being present was called upon for an address On coming forward he was received with warm applause. He said:

MR. CHAIRMAN AND GENTLEMEN: I am very pleased indeed that I came in at the commencement of your meeting to day, because I have had the privilege of hearing the report that has just been read relative to what you have accomplished at the World's Fair. You will, I know, allow me to congratulate you, first of all, on the part you have played in winning laurels, not only for yourselves, but for Ontario as a Province. at that great exhibition, and secondly, on the great success of your annual exhibition here in New Hamburg.

If we cannot boast in this Province of ours of the rich plumage of our forest birds or of their brilliant song, we can now claim superiority so far as our pure bred poultry is concerned. It is not now my opinion,—it is not the opinion of your Association,—it is an established fact, which has been proven against all comers in Chicago that we hold a foremost rank in this regard. It will be useless for anyone now to say that our poultry raisers are behind those of any other country in this industry. We have succeeded in convincing ourselves and the Americans and the world that we are quite abreast of the times

But I want to say also that there is no one who is at all of an observant turn but will realize as he goes about the country that all our poultry is not up to the standard of that you saw at Chicago or at this exhibition. They are away behind what we would like to see them: they are badly bred, badly housed, badly attended to, and, as a general rule, they bring in very bad returns as well.

What I would like to do would be to devise some means to disseminate the better blood that you see here and at Chicago generally throughout the Province. The chances are that I am looking into the future in this, and see things from a different standpoint to what some of you do. But, as head of my Department, I would like to accomplish something in this line, and you will not blame me when I seek to use this Association in aiding me to achieve so desirable a result.

Some people say, why should you bother so much about poultry? Such a small thing? Such a little thing? But is it small? It is smaller than it ought to be. But is it small? In connection with my Department we have a statistical branch known as the Bureau of Industries. I was looking over the last return in reference to this matter and I found the number of fowls given for the Province as seven millions. These statistics are compiled from the figures sent us by the farmers and from municipal statistics as well. One million are other than what are ordinarily called chickens But take the number at six millions; I do not think I am unreasonable in stating that we ought to expect even at the present status of things an annual output of eggs to the value of three millions dollars, and of dead poultry one million I see that the Department in Washington has given us a statement showing that the value of their annual output is for eggs two hundred millions of dollars, and for live poultry one hundred millions, making three hundred millions' worth annually. We are of course a small territory as compared with the United States—but it is no mean thing– it is not a small industry. It will not do for anyone to tell me that it is not worth bothering about—it is too great already to remain unnoticed—it is worthy of our best effort in order to develop and make further advancement.

The point I wish to make is that by introducing this better blood, we are bound to increase the value of the annual output considerably. How much that may be increased, you can tell better than I can. I do not think it would take very much effort to increase it 25 per cent. which would mean another million dollars annually.

I think an Association of this kind should keep in mind that so far as the mass of the people is concerned, to whom we direct our efforts, practical utility is what is required. I do not doubt for a moment that some of you are breeding and caring for your poultry as recreation, that is, you are doing it for the fun of the thing. But the general farmer of this country does not do it for that reason at all, it is dollars and cents with him that forms the incentive to improve the quality and increase the

quantity of his output, and you cannot bring any other motive to bear upon him. I want you to bear this in mind. It is not the particular color of the wing, or tail feathers of a particular breed that the farmer is anxious about, but rather the quantity of eggs that come into the basket every day, and the quality of the bird he can send to market. We must bear this in mind in giving our information if we hope to improve the general product.

Now how are we going to accomplish this? By what means shall we disseminate information, and how shall we cause the farmers of the country generally to become more interested in this industry? My answer is by means of this Association. This is the means that I feel bound to undertake to use toward this end. The holding of this exhibition is not the sole end you ought to have in view for your existence, —it is not the ultimate aim. If it is, it is not the object the Government had in view in making you your grant. It is an only means to an end. You gentlemen who are prominent in the breeding of fowls, bring them here primarily to win prizes, but they are an educative medium also. You present the ideals that the people are to copy. The visitor to your exhibition becomes enthusiastic over what he sees. He says, I would like a fowl like that. Men who are away behind go home with more inspiration. I do when I come, and I presume this will be the experience of hundreds and thousands of our people who attend our different exhibitions. You present the ideals and you carry away the prizes you fairly win, but this is only a small matter. The bulk of our people are not here, but are looking for correct information,—information that you gentlemen have at your fingers' ends, as to how to go about this work. I want the members of this Association to undertake the unselfish task of being a means of communicating this information. Will you do that? It is a new idea to some, but it was the idea the Legislature had in view in giving you your grant. You have seen some of the reports that we publish in my department. Here is a copy of your report, —you have all seen it, —don't it look a little thin? (Laughter) I mean exactly what I say. I think if you read it through you will find that it is a little thin inside too, although the quality may be very good. That report ought to be one of the most useful that goes from my department. Why do I say that? I never came in contact with an association in connection with any of our other agricultural industries that had a better, brighter and more intelligent membership than this. I never met men who were better able to express themselves, who had more information about their business and could give more to the public than this Association. But the information is not in that report. You had a live wide-awake discussion on one of the papers read at your meeting last year and published in your report, but it was all lost to the outside world. Those who were present took it in, but no one else received any benefit from it. I venture to say that there was scarcely a member of the Association, wise as I have no doubt they are, but gained a little information from that discussion. None of us possess all the knowledge there is in connection with any particular subject. When I find a man, no matter what he produces, who thinks that wisdom is going to die with him, and that he knows everything there is to know, and cannot be induced to impart it to others, I have a man that I have no use for in any Association.

I understand from your Secretary that this year you are going to give me a good deal more in the way of information than has ever been given before, and that instead of this thin report, we shall have a more valuable one; I am very glad to know it.

You may say I am asking you to undertake a very unselfish sort of task. I do not know whether it is or not. Suppose you give me a report such as the people of the country will value and containing valuable suggestions and information relating to this particular industry? Suppose I send out twelve or fifteen thousand copies of it to be read in the homes of the farmers of every county of the Province, what is accomplished? An additional interest is aroused in connection with this particular branch of agriculture; people become awakened to the possibilities of greater profit by better methods; they look at their own poultry, and say, we can improve these. If you have given them sufficient information, they will probably set about it, and after awhile you will find a greater demand for this better class of birds. This you will be able to supply. The next result will be that you will add to your profits, the farmer will add to his wealth, and the rest of the people will look on and smile because they see you both getting a little richer;

and they know that an additional opportunity will be offered to induce you to part with your riches at the first favorable chance. The result will be that the wealth of our entire Province will be greatly increased.

I want to say another thing, and I hope you will not think I am trying to offer any instruction, because I do not feel competent to do that; but is it not true that most of our people are breeding poultry entirely by guess work? It would puzzle a man wiser than "a Philadelphia lawyer" to know to what breed the birds belong. They may be useful, but it is entirely guess work. They gather their eggs by the basketful and set them the same way. Supposing they have one particular breed, there may be specimens of that breed that lay earlier in the season or produce larger eggs, etc., but they have no knowledge of them. Or by proper selection in this particular breed they may be able to produce along these lines exactly what they are seeking for. In order to do that they would need to have an ideal before them—some definite aim and purpose. This is something that I would like our people generally to have definite information about.

I am a strong believer myself in selection, whether it be in raising grain, cattle, poultry, or anything else. I believe that we run out a great deal of our grain because there is no attention paid to selection. I have seen men selling seed wheat of a certain variety year by year, and it does not seem to run out. Why? Because they find that at a particular spot in the field there is an extra sample. They take the cradle and gather it in by itself, they thresh it by itself and they have a sample better than the average of the field as a whole. In breeding horses, cattle and sheep we follow along that line all the time; but in poultry raising some of our people have no regard for this at all. In time you can run anything out, no matter how good it is at the start. Again it is not enough to make proper selections; our poultry will need to be properly housed, receive better attention and be given the right kind of food to bring about the best results.

These matters may be determined by the Association by discussion and interchange of opinion, which, when placed in print, form a guide and an inspiration to thousands who cannot attend your meetings in person. I am not here to tell the members of this Association how they ought to conduct their business, but merely to give you some encouragement in the good work you have in hand. I am here to render any assistance I can in helping you to give the information you have at your command to the masses of the people. I am thinking of their interests, the interests of the poor man who is struggling for assistance in this country; of the man who seeking light along these lines and wants information. I want that our Government should do what it can to give these people this light and information.

I believe you have started on a new era in connection with this Association. I think that now you have decided to move your exhibition from place to place you will add to the interest and usefulness of the Association year by year. I would like to ask every member to take hold vigorously of the work. With a shorthand reporter to report your proceedings, if the gentlemen present when papers are read will throw themselves into the discussions with a little vigor and give out the knowledge you possess, you will find that it is a great deal "more blessed to give than to receive,"—but I will guarantee that you will not only give but receive as well. You yourselves will be benefited, the masses of the people will be also benefited, and the poultry industry in our Province will assume the proportions that our climate and the intelligence of our farmers make it possible to reach. (Applause.)

Mr. Browne, Secretary: I am very much pleased that I have had the opportunity of hearing Mr. Dryden's address. He shows us conclusively that in the past our aims as an Association have been somewhat on the wrong tack. I want, however, to say that we are endeavoring to rectify this. I myself have made a special effort this year to have this meeting a success from the Minister's point of view, and I trust that the outcome may meet with his approval. Mr. Dryden is quite right about the size of the Report; but I did the best I could with the material at my command. About eight papers have been promised by members this year; and I trust that in future the report may be more creditable to the Association.

THE CARE AND MANAGEMENT OF POULTRY ON THE FARM.

By J. E. Meyer, Kossuth, Ont.

In these times of depressed prices in all farm products, the farmers of our province will do well to study most carefully the different sources by which their incomes may be increased. It is conceded by all parties and on all hands that the days when a large majority of our farmers depended chiefly upon their wheat crop to pay their rents and mortgages are gone, never to return, and that other things than grain-raising must in future engage the attention of those in this province who are going to make farming pay. The raising of live stock and their products, for which our magnificent province is so well adapted, and for which, I must add, judging from the glorious victories we won at Chicago, the farmers of Ontario are so admirably adapted, must in future form a large percentage of our incomes. How much more pleasant will farming become as we drift from the monotony of grain raising to live stock, which yields its harvest not only at harvest time, but at all seasons of the year, to him who is painstaking and industrious.

There is no live stock that will not pay, when properly managed, a larger percentage of profit than poultry. Yet, how many farmers entirely neglect their fowls. They forget that they require suitable shelter and food, as do their horses, cattle and pigs. Many of our farmers have barns facing south, with more or less shed attached, in which manure is placed. Now, the very best place for a farmer so situated to build his poultry house is in as sheltered a place as possible, so near the barnyard that the fowls can have access to it at all times. There is no place that the fowls will enjoy more during the sunny days of winter than scratching in the manure; and even in rather cold, stormy days they will venture out. The building itself should face south, and have plenty of glass towards the south. Nothing is better for the health of fowls than sunlight; nothing is worse for their health than damp. Be sure your building is in a dry place. Frame is better material to use than stone or gravel. You cannot build it too warm. Any extra money you spend to make the building warm will return to you tenfold. I shall now describe to you the interior of the poultry house and the fowls of a farmer I visited not long since. I do so because I believe that there are far too many no better, and, by pointing out the improvements that should be made, I may assist some who wish to make their poultry pay. The perches were placed on a level at one end of the room, for there was but one room, without a drop-board underneath. The droppings under the perches had been accumulating for months; the rest of the floor was slimy with filth. In the centre of the place was a beautiful device called a self-feeder, to which the fowls could go at all times and find, or, rather, not find, plenty of grain. It would hold several bushels, and is a capital thing for lazy people. The water vessel was all but filled with ice, and there were enough nest-boxes along one side for five times the number of hens he had. The building was fairly warm and well enough built. His flock of fowls, largely pure bred, was not too large, but it contained birds from a few months to six or seven years of age. Did the owner get any eggs? Did he deserve to get any, I ask? He pointed with pride to his cattle and horses, and thought his pigs quite the best in the neighborhood. Were they in filth? Did he use self feeding devices for them? No, indeed; he knew well that such treatment would soon ruin his fine stock. Of course his hens don't lay. What should he do?

First the perches! A great deal more depends upon them than most farmers suppose. In this case they were not too high up, being about three feet from the floor, so that the fowls ran no great risk of breaking their necks when descending every morning. Look at that hot-bed of filth and disease through which the fowls are constantly walking underneath the perches. Just think of the countless millions of lice such a place would breed in warm weather, and all the scaly legs and like filth that would go with them. While speaking of perches, allow me to use several other examples. I saw in one place perches at least ten feet high. The owner was complaining of lice, and well he might. Just think of the millions of them day after day sitting up there smiling at him in security, awaiting the return of the birds at night for the feast they never earned. Then there is the perch with the high seat, and the low seat, and the seats between, on which

all the birds quarrel for the high seat. The simplest and in every way the handiest way to build perches, is first build a tight platform about three feet high, and about a foot above this place your perches, which should be moveable. Coal oil, when used regularly on and about the perches, is the simplest way to keep down lice. You can easily get at perches arranged in this way. It will be quite easy to clean off the drop-board twice a week. You clean your horse and cow stable at least once a day, and consider it a necessity. You must attend to your poultry in the same regular manner if they are to pay. Do not forget that filth causes lice, and that you cannot raise lice and eggs together. That self-feeder should be taken out and destroyed. The floor should be littered six inches deep with straw, and the grain, just enough at a time, should be thrown amongst it. The hens will scratch for it, and plenty of exercise means more eggs. Lazy hens rarely lay. Hens need a variety of food. Wheat is the best grain, but corn, buckwheat and barley are good. Oats are best crushed, as otherwise they will leave the light grains Pulped turnips, cabbages and apples are necessary, as well as meat occasionally. But clover, hay, or better, second crop clover, cut fine, mixed with crushed grain, and steamed by placing in a wooden pail and pouring boiling water over it, and then covering with a cloth for a time, makes a most excellent and cheap egg food. It should be fed in the morning. Give your fowls warm water to drink at least twice a day during cold winter weather. It will more that repay you in increased egg production.

The last mistake is one that is far too common amongst our farmers, and one for which they pay dearly, namely, the rearing of chicks as late as July, and keeping the pullets amongst the larger fowls during winter where they cannot thrive; besides, it takes far more food to bring them to maturity during cold weather. Now, chickens of no variety should be hatched after June 1st. It will do very well to hatch the small breeds during the last of May, but the large and medium sized breeds should be hatched not later than the middle of May, so that the pullets may be ready to begin laying before the cold weather sets in, when, with proper care, they will lay throughout the whole winter, while eggs bring the highest price. You cannot expect success with birds of all sizes and ages. Twenty pullets hatched in April are worth more that double the number hatched in June. On the other hand, no hen should be kept the third winter unless she is an extra good one.

Another great mistake is keeping too large flocks together. There is no profit in keeping 100 hens in a place hardly large enough for 50. In fact, I doubt very much if 100 hens should ever be kept in one flock. I consider 50 an outside number. They will lay more eggs during winter in the same place than 100. To illustrate: For several winters I kept from 25 to 30 birds in a pen 14x10 feet, and got very few eggs. Of late winters I keep only half the number, and I get more than twice as many eggs. If you are keeping 50 hens, you should raise 25 early pullets each year to replace the 25 two-year-old hens which should be killed in the fall, as soon as they begin to moult. They will be in good condition then. In this way you will always have birds that, with proper care, must prove profitable. Remember that besides small flocks, your birds must have plenty of room. They cannot have too much.

Another very costly and very general mistake is the keeping of half a dozen male birds. The 175,000 farmers of Ontario are feeding at least 700,000 male birds, and to what purpose? I have reason to believe that a vast majority of our farmers would answer, "For the purpose of increasing the egg production," for I have had farmers tell me that they always thought that, without males, the hens would not lay; whereas the truth is that they will lay just as many eggs, but with this difference: The eggs will keep far better and longer when the male is removed. Remember that if you feed a hen the proper material to make eggs, and put her in the proper place to make them, she must lay, for she is nothing but a machine to manufacture eggs. One male bird, then, is sufficient for each farmer We find, then, that the farmers of Ontario are feeding at least 500,000 male birds that are unnecessary, and that annually cost them $500,000 to feed, and bring them absolutely nothing. Replace these males with as many young hens, and they will, if properly handled, pay for their feed and bring in a profit each. Here, then, is half a million dollars for the farmers where now they lose annually that amount, or, in other words, the farmers of Ontario are out of pocket at least one million

dollars annually through keeping too many male birds. You should always select a pure-bred male. When it is time to mate up your breeding pen, select 10 or 12 of your choicest females, and put them in a pen for the purpose with the male. It will pay you to have an outside run to this pen. Take your eggs for hatching from this pen. If it is the second season for the male, get rid of him as soon as you have saved enough eggs. Be very careful not to in-breed. It destroys the egg production of your hens, and it destroys their vitality and size. By selecting your breeding birds in this way, you can choose not only the largest and finest, but the best layers, especially if you choose yearlings, from which you are likely to obtain the strongest chicks. By breeding thus, you will add materially to the value of your fowls year by year. The number of eggs your hens will lay will greatly increase, and instead of the miserable dressed poultry we too often see on our markets, and that weigh not more than four or five pounds per pair, we will see fine, plump birds that dress five and six pounds each, and sell for twice as much, while they cost the farmer very little more to raise. The demand for perfectly fresh eggs and for plump, tender fowls will never cease. They will always command good prices.

On Christmas day a farmer visited my yards, who has built an excellent poultry house, intending to raise fowls and eggs for the market in large numbers. He said that it does not pay him to sell wheat at present prices, and thinks he can make more out of it by feeding it to fowls. I have no doubt that, with careful management, it will pay him well, but see how he begins. He has bought birds of six or seven varieties. Is it to be expected that a farmer without any experience can pay out money for so many varieties and make it pay? Is it not nonsense for a man who wishes to keep hens for eggs only to buy Minorcas, Leghorns and Red Caps to begin with? Where is the man who will say which of these great laying varieties will lay most eggs? Who will say which is the best general purpose fowl? It is not necessary, then, for one who wishes a general purpose bird to begin with four or five varieties. No! Visit poultry shows and choose one variety of either great layers, or general purpose birds, or one of each. Choose the variety you like best. If you don't know which you like best, wait until you do know. It would never have done if you had liked three or four girls best when you made up your mind to get married, neither will it do here.

In conclusion, I would recommend that lectures on poultry be given at Farmers' Institutes. It is largely owing to the lectures in dairying at these meetings that the value of the cheese product of Ontario has increased from $5,500,000 in 1883 to $9,000,000 in 1892, or almost double, to say nothing of increase in value and quality of butter produced. I am convinced that suitable lectures on poultry would be of at least as much benefit to our farmers. I know that a chicken is considered by a great many as of no consequence, and that to be a chicken-breeder is thought a very low calling, but I tell you, gentlemen, that the time has come when the farmers of Ontario must look for their incomes to every available source if they are going to thrive. Raise the poultry on your farms to the same standard of excellence as your other stock; give them the same attention and intelligent care you do your butter and cheese-making and your fine stock, and you will add millions to the wealth of this province, and thousands of dollars annually to the incomes of our farmers.

CROSS BRED FOWLS FOR THE FARMER.

Mr. Alles Boggs delivered the following address. Owing to the pressure of business, I have not had time to prepare a written essay, and all the information I have to give you is therefore impromptu. During the past thirty-five years I have given considerable thought to matters connected with poultry raising, and one of the conclusions I have come to is that the real value of the male fowl is dependent upon what it is worth for the spit, and of the hen what she is worth for laying. With this in mind, I have thought over the question of what would be a good class of fowl for the farmers to raise. Let us consider some of the questions that have an important bearing on this sub-

ject. It is well known that some varieties have such large combs as to be readily susceptible to frost in winter. The freezing of the comb is very detrimental to egg production. If the comb of a laying hen be frozen, she ceases to lay. Her system is at once weakened, and the forces that should go to the production of eggs are used up in other ways. My idea, therefore, is to get a bird with as small a comb as possible. To accomplish this, I have concluded it is not necessary for the farmer to adopt a pure-bred variety of fowl, although I have great faith in pure breeds; but I believe that a cross-bred variety will answer his purpose better.

There are pure bred varieties enough to select from to produce a cross-bred bird with a greatly lessened amount of comb. I have bred the Dorking for thirty-five or forty years, and have great faith in that old-fashioned English breed. It is a good egg-producer, a good sitter and a good flesh-producer. I consider that this breed, crossed with the Indian Game, makes an excellent variety. There is no better breed in existence for laying on flesh than the Indian Game. The Dorking has too large a comb, but the Indian Game has a very small comb. Both possess the qualities necessary in a good roasting bird. The Dorking is short in the leg, small in bone, and lays a large quantity of flesh on the breast; so does the Indian Game. English poultry-raisers have gone largely into cross-breeding. I read an article on the subject in one of the English journals not long since, which said that the Indian Game crossed on the colored Dorking produces a very large fowl, and has very much the same effect that the cross of a short-horn has upon the common Canadian blood in cattle. It is the very best cross that can possibly be made for the production both of eggs and fowls.

I think that some years ago I suggested that this Association was not fulfilling its mission, partly from lack of funds. I suggested that such experiments as this should be tried; but the matter was never brought as prominently before the Association as it should have been. But we are entering upon that field now. As an example, I tried the crossing of the Partridge Cochin upon the Silver Grey Dorking. I have produced a hen with a very small comb, and have no doubt they will be good layers.

I believe in cross-breeding for farmers. This may be done very cheaply. A cull worth 50c. is as good as a prize bird worth $50 for this purpose. The color of the bird is of no importance, but simply the bulk of flesh it will produce. Say a farmer lays out fifty cents or a dollar for a cock, and buys three or four females of some other variety, he will then have a foundation for a cross. I have no faith in in-and-in-breeding. I have proved that, take even the finest breed of birds and breed in-and-in, and the breed loses in every respect. I believe in a first cross.

If the farmers would only wake up to the importance of this matter, I think they could increase the value of their poultry flocks fifty per cent. a year. It is not taken for granted that all our farmers are to become exhibitors,— we do not expect that,—but if they will only act as wise men, they will increase the value of their flocks in this way. They may depend upon it that it can be done.

As Mr. Meyer set forth in his paper, there is much to be taken into consideration in the housing of poultry. You do not want the house to be too warm,—that would not be healthy,—but the birds should not be exposed to every blast of wind that blows. Take care to keep the roost clean; there is no greater pest than the chicken louse. Hens are so weakened by lice as not to be able to produce eggs.

I believe that we should select our crosses with a definite aim in view. If egg-producers are wanted, let the foundation be birds that are individually noted as good layers; if flesh-producers are wanted, select birds that are most apt to lay on flesh. So that a farmer can have two varieties—one for laying and the other for marketing.

It does not require much outlay to start a farmer in this direction; and as the duty is likely to be removed from eggs going from this country to the United States, the production of eggs is likely to become an important industry. You will remember that under the McKinley bill there was a duty of five cents a dozen on eggs crossing the line; that is a very good profit. We may in this way increase our export to the United States. You know how rapidly the trade grew when there was no embargo upon eggs, and you know how rapidly it fell off afterwards. There is every reason to suppose, therefore, that, with the duty removed, the trade will once more increase.

Mr. McCormick: In reference to light for poultry, I think Mr. Meyer in his paper struck on a wrong line. My experience has been the very reverse. The reason is that when the sun is shining, the large amount of glass causes a great deal of heat during the day, when the poultry are awake and have no difficulty in keeping themselves warm. But at night the effect of frost on the glass produces cold, and the birds are not comfortable. Mr. Meyer spoke about hatching after June; I may say that my best result have been with chicks hatched in June.

POULTRY POINTERS.

By George G. McCormick, London, Ont.

I am glad that I am again permitted to meet with you all, at this our annual gathering of the poultry and pigeon breeders and fanciers of Canada, who are doing their best for the advancement of the poultry industry of this grand and loyal country of ours. We are no mean organization, thanks to our Government, and especially to our worthy friend, Hon. John Dryden, Minister of Agriculture, who has done more to awaken interest in the right direction, than all his predecessors combined. Our Governments are beginning to realize the necessity of nursing the poultry organizations, but down at Ottawa they are trying to enlighten the poor farmers by building chicken palaces that cost large sums of money, and everything else connected with them of the same elaborate government-built style, excepting the poultry, which, of course, are secondary matters. Mr. Gilbert, the manager, (a competent man, I believe), being allowed to pay as high as $4 each for a very limited number of world beaters. What can be expected of a poultry manager, so hampered, and who is allowed to say little or nothing as to what is required. (Plenty of say, perhaps, but little heed given)! Of course, the Government understands it all: so did the World's Fair managers in the poultry department. What a mess they made of it. That is what our Dominion Government is doing at Ottawa.

Imagine, if you can, a gentleman owning a fine estate, with beautiful residence, stables, etc., purchasing a handsome carriage and harness, engaging grooms, footmen and drivers all in livery, and then buying a pair of dray stand mules, or gipsy horses to complete the outfit. Our Government poultry houses are a piece of useless extravagance, that either scare enthusiastic farmers or help to ruin them in their endeavors to imitate. What we want are model practical houses, or plans, such as would be required on ordinary farms and market gardens, in sizes and styles to suit heavy and light breeds. A house fit for Mediterranean classes is not suitable for Asiatics, and *vice versa*. I would like to see a number of plans, according to the ideas of the different fanciers, at our next annual meeting.

Our Ontario Government, by giving a grant to this Association, has adopted a plan by which ten times as much can be accomplished for the good of the country as can be obtained through the Experimental Farm at Ottawa, and we are now on the right track to accomplish it. Through this medium Ontario gets the ideas and experiences of scores of practical men, instead of one or two, as is now the case at Ottawa. No individual breeder can teach the country everything, in this or any other industry; hence the necessity of urging experienced men to let us have their experiences at these meetings, at the same time inviting real and friendly criticism and discussion.

I will repeat (by request) a few remarks made at our last meeting regarding the preservation of eggs, or to the same effect, with perhaps a little added. The first essential to a marketable egg is infertility, which can only be had by the separation of the sexes. Some may ask why? That is a question easily answered. Is there a breeder or fancier present who has not had perfectly clear eggs in a setting after a hen had been on them for three weeks or more? This will prove to you what an infertile egg can stand. It is the germ of impregnation that causes an egg to spoil when kept for a length of time, especially during the warm months. When the hatching season is over, all male birds should be put away, and after, say two weeks, all danger of fertile eggs

being gathered will be past. The eggs should be gathered every day, and packed away in oat hulls or straw chaff; never pack eggs in bran or anything that is liable to become musty. When enough are gathered to pack a full box, a cover should be nailed or screwed on, so that the box could be turned over every day, or every two days; it is not a big job when you have them in full cases.

While eggs are being gathered, and until there are enough to fill a box or case, they should be placed on the large end, not on small end as a great many will tell you, without being able to give any good reason for doing so. On the other hand, a good reason for not placing eggs on small end, and leaving for a length of time, is that the yolk settles down and becomes wedged in the funnel-shaped end and adheres to the shell, which in time causes the yolk to harden, as if partially boiled. In every egg there is a space at the large end; the skin running across from side to side forming an air cushion between the shell and egg proper. This cushion, when the egg is placed on large end, prevents the yolk from reaching the shell, and keeps it in its natural condition for a moderate length of time—I should say at least three or four weeks. Oat hulls or dry straw chaff are, I think, the best egg packing materials that can be had.

Now is the time for our Canadian farmers to wake up over this egg business, as the prospects are becoming somewhat brighter, now that Uncle Sam has found out he cannot get along without our Canadian hen-fruit, and has seen fit to place it on the free list once more.

The great majority of farmers start off wrong with the fowls and chicks. All newly hatched chicks should be put far enough away from the old fowls, in a shady nook or corner by themselves for at least three months, so as to ensure their getting plenty to eat and drink. They should be fed not less than three times a day. Corn chop, bran and shorts, mixed with skim-milk will be found excellent food. The rapid growth of the chicks will more than pay for the extra trouble and expense. Wheat should always be fed to chicks for their evening meal, instead of soft food, as it takes longer to digest, and will keep them from suffering through hunger, until the morning meal, which should be immediately after daylight.

My advice to farmers is to allow their hens full range, of at least the barnyard, if nothing more, but it is far better to let them run where they will. Don't get the idea that they are going to destroy the whole crop—they will help to save it. Of course most garden vegetables, such as lettuce, celery, beets, etc, should not be planted in close proximity to the poultry house, but potatoes cannot be planted in a better place, as the fowls will not hurt the Paris green, nor will the Paris green hurt them, but woe to the early little soft potato bug Try it. Corn in quantity, turnips, carrots and cabbage can be safely planted at moderate distance. They may find a few grains of corn, or pick an odd cabbage, but will more than make up for any loss by their regular attentions to the egg basket, and the healthy condition in which they will be found.

There exists, at the present time, in our part of the province, and I think pretty much all over the Dominion, a custom of selling eggs by the dozen, and poultry by the pair. That is neither fair to the breeders, merchants nor consumers. Eggs vary materially in the number to the pound, the average usually being about eight, but I have seen them run from four to as many as eleven to the pound, yet they are so much per dozen. They should be sold by weight, and so should poultry, especially. From fifty to sixty cents per pair, big and little alike, is the price they usually go at on our market. I walked into a butcher shop in our city and asked the proprietor what he would pay me for twenty-five or fifty pairs of chicks, alive or dressed, by weight. His answer was, fifty-five cents per pair dressed, saying, that he could not sell them by weight; everything went at sixty-five cents per pair, no matter what size. I agreed to send in a few pairs as a trial, saying that they would weigh double the ordinary market fowls. We picked out the largest pair that he had bought on the market, which weighed six and one-half pounds; the smallest pair that I had weighed seven pounds, and the largest fifteen pounds dressed, all being spring chicks. Now, you see the injustice of selling poultry by the pair, fifteen pounds for the same price as six and one-half or seven pounds. They should be worth at least six cents per pound live weight, or seven cents dressed, any time after October 1st, if hatched in the spring. It is all well enough early

in the summer, when spring chicks weigh only a few ounces, and are bought by the blue-blooded aristocracy as a delicacy; but when they grow to be an article of food, we want them sold by weight. If you want a turkey, nine to twelve cents per pound is the price, and if we cannot get six to eight cents per pound for chickens, there is no use growing anything but barnyard scrubs for market purposes, which usually weigh little enough to bring ten cents per pound at sixty cents per pair. I might also say the same of ducks—when do you ever see them sold by weight? I never have. Such a state of affairs, if continued, will demoralize our egg and poultry business, and I think it high time that the farmers and dealers of this country should insist on selling eggs and fowls of all kinds by weight; the matter rests with them. And if there is some way, either through the Government reports, journals, newspapers or by any other means that might be suggested by anyone interested, that would bring about such a result, it would lead to an advancement in the quality of the poultry of this Canada of ours that has never been seen in this or any other country.

This poultry business is a good deal like the cattle business. Some farmers will go in for butter, and must have Jerseys; some want the milk and must have Ayrshires; some want beef, and must have Durhams, etc. The farmer who wants eggs principally must seek the Mediterranean or Hamburg varieties; those who want early meat, must go in for the American classes; those who want winter meat, must go in for Asiatics, Games or Dorkings; and last but not least, by any means, those who want something to interest the boys and girls at home, and keep them out of mischief, must go in for bantams.

We are not, by any means, behind the age in this industry, and I am well aware that we are in advance of the United States in this and many other lines of live stock, but there is plenty of room for improvement; so let us all unite in one great and long effort to so far eclipse any other country, that our eggs and fowls, both for market and fancy, will be in universal demand.

Mr. Dilworth: I think that one statement in the foregoing paper requires some modification, that in reference to Paris green. When Paris green is properly used there is not the least danger, but people do not always use it properly. If they would mix it in the proportion of a teaspoonful to five gallons of water, it would not injure the fowls; but they usually put about two tablespoonfuls in that quantity of water.

Mr. McCormick: I am glad to find out that I did not know how to use Paris green. I use a tablespoonful to a pail of water. My fowls are running among the potatoes all the time and I never lost any from this cause.

Mr. Bigrs: I think Mr. McCormick makes a mistake when he says that chickens will eat potato bugs. My experience is that they must be mighty hungry before they will do so.

Mr. McCormick: My chickens are not very hungry as a rule. They will not eat hard shelled fellows, but the young, soft bugs.

Mr. Trew: I raise about 150 chickens annually. I never yet got my chickens to eat potato bugs. I use Paris green, and have never had a bird hurt.

Mr. McNeil: I raise from 150 to 200 chickens annually in my garden and I use Paris green, but not as much as Mr. McCormick. A teaspoonful of Paris green dissolved in a little vinegar will kill the bugs and will not hurt the potatoes one bit. I have no bugs for my chickens to eat. I kill the bugs and I do not think the chickens eat them. But my fowl are of a more aristocratic variety—Polands, Cochin Chinas, etc., will eat what other birds will not.

Mr. McKee: I agree with Mr. Meyer on the question of windows. I have been increasing the size of my windows every year. They are now 3x5 feet, and I would like to make them 3x6. I want such a window in every pen, and I want it to the south and double, so that when the heat comes in during the day it will not go out at night. About packing eggs, I pack mine small end down. The year before last I packed away eggs in May and June and did not open them till February and March and there was not a single bad one among them. I grease the eggs, pack in salt and keep them dry.

This year I packed in June, July and August and am using them now right along. You say that chickens are 50c. and 60c. a pair in London; I see them selling at 25c. a pair all through the country.

Mr. BURN: I have been in the poultry business 28 years. With regard to dressed poultry, I buy it in our town (Tilsonburg). The birds must be drawn and have the heads off. In August we start to get some spring chickens, paying as a general rule a shilling a pound for them. Along in October they get down to eight cents, and at this time (January) we pay six cents. At Christmas time I paid 8c. for ducks, 10c. for turkey and 6c. for spring chickens. I will guarantee to buy all the chickens I can get at 30 cents a pair.

Mr. GRILLS: You can buy car loads around Belleville at 30c a pair.

Mr. BARBER: I have been in the poultry business in Toronto for 22 years. When chickens first come into the market I pay 80 cts. a pair for them. Up to November you can get 60 c. to 70c. a pair. From this on till January, and till chickens come in again, first-class birds will fetch 70 cents a pair.

Mr. MCCORMICK: I would like to ask one question, would you prefer to buy and sell poultry by weight?

Mr. BARBER: I would like to sell it that way.

A MEMBER: In this part of the country we sell fowls by the pound. We have to pay 7 cents a pound for spring chickens and 10 cents for turkeys. We would certainly like to buy spring chickens at 25 cents and 30 cents a pair, but we cannot, and I think our farmers may be satisfied that they are getting the best prices.

ADDRESS BY JOHN T. MOORE, M.P.P.

You know I am not a great poultry man, except that when I come to the table I generally do my share. I did not expect to be called upon for an address to-day, and do not propose to take up much of your time. I am very happy to see this show here in our county, and to have these gentlemen present with us I have not yet seen the show, but understand it is a great success, as I expected it would be. We have quite a number of fanciers in this locality. and they have gone to considerable trouble and expense in the matter. I do not know that we can claim much in this county from a poultry point of view, but it may take a considerable amount of praise to itself so far as eggs are concerned. You are all aware that the egg business has assumed large proportions within the past few years. I happen to know considerable about the business, although I was never in it. It may surprise you to know that nearly every man of any consequence in the business ranks from this county (Waterloo). The exportation of eggs started first about thirty years ago with a friend of mine who came over from the other side. From him started nearly all the men in the business to-day. Many were raised in the vicinity of Galt, and quite a number of the most successful ones were raised on the lot where I happen to live. Those in the business in Waterloo, Fergus, Seaforth, St. Mary's, Strathroy, even as far as Peterboro' all come from this country, so that we may take some credit to ourselves in this regard. It was men from this country who put up the first cold storage west of Montreal. The first year it was tried as an experiment and cost $2,000, and it has spread from that till it has reached its present extent.

POULTRY SHOWS, AND THEIR RELATIVE VALUE TO THE FARMER.

By C. J. Daniels, Toronto.

Speaking on the above subject opens up a very wide field, and one I shall not attempt to cover in this short address. But I will take a few points of interest to every farmer. Of what interest are poultry shows to the farmer? I answer, much every way. First, go back, if you will, say fifteen or twenty years, and what do you find? On the majority of farms, fowl about the size of partridges. Here is a case in point. I was at Brampton some three winters ago, and called on a well-known poultry dealer there. He remarked, "I have something to show you," and he took me to his store window and there was as fine a string of cockerels, dressed all ready for Toronto, not a bird weighing less than 6 lb., nice yellow flesh and good plump bodies. These birds had been picked up at a farm house, and were a cross from a Barred Plymouth Rock cock on the common barn-yard fowl. Here we see where breeders and poultry shows are doing good work, and, for the benefit of our farmer friends, I would say I do not know of any one breed that is better adapted to improve poultry on the farm than the Plymouth Rock or Wyandotte. They fill a want between the large and small breeds, and besides good flesh they have the additional qualities of hardiness, vigor, docility and productiveness. They make good foragers on the farm; they become self-reliant and will provide for themselves a good share of their living during good weather. They also stand the summer's heat and winter's frost, neglect and uncomfortable quarters, without showing signs of deterioration.

The Experimental Farm at Ottawa is doing a good work in supplying farmers with pure bred cockerels and eggs for improvement of their stock. Mr. A. G. Gilbert, of the Central Experimental Farm, in his report for 1891, says: "As a general rule, the farmers of the country inbreed from one year to another with a loss of vitality and size to their stock. Another advantage to the farmer using pure bred males is the increase in number of eggs. A poor, run-down hen or pullet will not lay more than 75 eggs per year; by getting new blood infused, you will double that number or more." All this goes to show that the fancier and poultry shows are of sterling value.

A word to the farmer. Outside of poultry shows there is a part you will have to attend to yourselves, viz., proper care and proper quarters. The most proper and most sensible way for a farmer to keep poultry is to provide not expensive, but comfortable quarters for it to live in. My experience with many farmers' hen-houses has been that I have been glad to get out and look for an itching post. The houses should be thoroughly cleaned once every week, as the cause of insects is not to be laid at the door of the fowls, as you do not find on the body of the fowl the kind of louse that infests the roosts. They are entirely of a different character, color and form. Of the body louse the hen will free herself if her quarters are kept clean, and the house will never be infested with the grey louse or red nit if the house is so kept, and the poultry will always go there to roost and to lay. A large percentage of eggs laid about a number of farms are lost, because the fowl will not venture inside the poultry house to lay for fear she may be consumed by the vermin that infest it. Outside this care and attention, they should receive in summer sufficient food to keep them in fair condition, not fat, as an over fat hen will not lay in winter. They should be fed sufficient to keep them from being hungry.

In conclusion, I will say, brother fanciers, it is the duty of every breeder of fine fowls to exhibit his birds and add his share in the education of the farmer and others by convincing them of the advantages to be derived from the improved breeds. The enterprising and wide-awake members of this class are not slow to see the advantages of fine fowls over scrubs, just as they see the merits of other fine stock over the common blood.

Mr. Bogue: One thing has struck me during the reading of these papers, that is that most of them have referred to the presence of lice in the hen house. I have a cure for that, namely, to saturate the roost with common coal oil before the hot weather

sets in. That will keep them off till 1st July. Saturate it again, then, and you will not be bothered with lice. There is one point I forgot to mention: if a farmer intends to breed cross-bred fowls, or fowls for the improvement of his stock, he should purchase the eggs instead of the fowls, because it is dangerous to purchase a fowl at any of our poultry shows; you run the risk of buying a bird that has a disease, and thus introducing it into your flock. I therefore suggest that you buy the eggs.

Mr. TREW: I want to ask why you clean out the hen house only once a week? I clean mine every morning and give my hens from six to twelve inches of sand to dust themselves with every day. To prevent lice, I use a mixture of crude carbolic acid and coal oil and apply once at the beginning of the season.

Mr. DILWORTH: A good plan is to take two oyster cans, cut them down by half, fill with coal oil and place one at each side of the roost; then extend a piece of lamp wick from one to the other.

A MEMBER: I have never used coal oil or anything in that line. I simply whitewash everything, and the floor of the roost is earth. In the middle of summer I never have vermin, and the birds have been in the same house for eight years. My chicken house is cleaned out every morning, or nearly so; but you do not want to put too much work of this kind on the farmer. If he will clean his once a week, he is doing well.

Mr. HAYCOCK: As I understand the proceedings of the meeting are to be printed, I think that the impression likely to be created by a remark made by Mr. Bogue ought to be corrected. He advised farmers to buy eggs instead of fowls, and left the impression, on my mind, at any rate, that it was dangerous to buy fowls from fanciers. I think that would be a very injurious statement to appear in the report of our proceedings from one of our oldest and most prominent members. I am of the opinion that it would be much better for farmers to buy the birds rather than the eggs, because, in nine cases out of ten, the farmer would improperly raise the chicks, and the birds would be but imperfect specimens of the breed and not nearly so good as they ought to be. It would be better to buy the bird fully grown and fully matured. So far as disease is concerned, it is true that many of the birds in breeders' yards are diseased, but I hope the impression will not go out that any breeder who is a member of this Association would be guilty of sending out diseased birds. I have been very much interested in what has been said, although in some of the essays read some things came up that were at variance with my ideas. For instance, one member advocated as little glass as possible in the poultry house, while another advocated as much as possible. I believe that both are right and both are wrong. We find that it is best to have the windows hinged. The difficulty of a house becoming too warm we obviate by opening the windows. Small windows are all right on a sunny day, but when you get a dark, cloudy day, and especially if there is dust on the windows, it is sometimes too dark for the fowls to see the grain, especially if it is of a dark color. I think the proper way to ventilate a house is to open the windows. Another point came up in reference to the buildings in the poultry department at the Dominion Experimental Farm, Ottawa. Mr. McCormick has correctly described those buildings. I had the pleasure last winter of inspecting them, and I feel like speaking strongly on the subject. They have been erected at a very large expense in the most elaborate manner, and are filled with about as miserable a lot of culls as I ever saw in my life. About one-third of the building should be devoted to a hospital for sick fowls. These buildings were erected under the Superintendent of the Experimental Farm, who has practically no experience in this direction. The plans were prepared in the office of the architect without listening to the advice of Mr. Gilbert, who is one of the most practical men on poultry I have ever met. In the matter of windows, some are facing south and some west, the latter being always useless for the purpose of keeping fowls. Mr. Gilbert is, to a large extent, handicapped, from the fact that he occupies only a subordinate position. What I think ought to be done is either that the poultry manager should be placed in the same position as the Dairy Commissioner and allowed practically to control his department. This is supposed to be for the benefit of the farmers. They see buildings there that are beyond their means, and they see a lot of fowls that, if they ever had any intention of going into the poultry business, would cure

them effectually of such an idea. With regard to perches, we take a cedar post eight feet long to the mill and get it quartered. We use that, and find that it is about right for the purpose.

Mr. Bogue: I am very glad that Mr. Haycock took the view he did in reference to my remark, because I did not intend to cast any reflection upon the breeders who bring fowls here. But I thought incidentally that it might happen to a purchaser to buy a diseased bird—I did not say from a fancier—and thus introduce disease.

Mr. McCormick: In speaking of small windows, I stipulated that they should be of size enough to give plenty of light, but not to let in the sun and heat.

Mr. Daniels: Mr. McCormick mentioned Mr. Gilbert at Ottawa. I shall refer to that matter also. I believe Mr. Gilbert is doing a good work so far as he is able, but I would just say that he is very heavily handicapped.

Mr. Ernst: With reference to the use of Paris green referred to in Mr. McCormick's paper I would advise the use of as little as possible. It is a poison, and the less we use the better. With regard to light, in my poultry house, which is a small one, the windows are 5x6. Large windows certainly admit the cold, but I use double windows and find them work admirably. I do not take them out summer or winter. When I want ventilation, I open the door and have a ventilator in the top of the building. I think that Mr. McCormick is a little inclined to put political coloring into his speech.

Mr. McCormick: You thought I was a Grit?

Mr. Ernst: I knew that.

A Voice: That is what he is not. (Laughter).

Mr. McCormick: I would like to tell the crowd here that I am a Conservative, and never gave a Grit vote in my life, and I am going to put the first Grit vote right on Mr. Bogue. (Applause).

Mr. Ernst: I do not agree with the use of hot water for fowls, as I think it is against the laws of nature. Take, for instance, a man accustomed to hot drinks; he is liable to catch cold more readily—and it is the same with fowls. With regard to killing lice in the poultry house, I use an idea of my own. I put all my chickens into the run-ways, close up every point of vent in the house, place a large iron pot with two or three pounds of sulphur in the centre of the building and light it. After two hours there will not be a single louse to tell the story.

HINTS TO THE AMATEUR AND FACTS FOR THE PROFESSIONAL.

By Chas. F. Ernst, New Hamburg, Ont.

In this era of public competition, I think it is well understood that the professional breeder, in most of cases, secures the most of awards in shape of prizes, etc., owing to having full knowledge of his business, and backed by experience. The agriculturist, on the other hand (with few exceptions) has an idea that fowls on the farm are unprofitable, prices too low and that they destroy crops, etc. I am pleased to know, however, that such impressions are daily losing ground, and that ere long the professional breeder will have closer competition at our annual exhibitions, and that many prizes will be carried off by the agriculturist in the future. My reasons for such, are, that the farmer, whose barnyard is the "Paradise of Poultry," has the best facilities for raising and protecting poultry, his expenses are less, and with a little better knowledge of poultry culture, he will no doubt not only improve his position but be one of the closest competitors for honors in the poultry shows, and when he does attain this position, I trust he will not forget to place some credit to our Poultry Associations, which have been unceasing in their efforts to cultivate this branch of industry amongst the agriculturists. Allow me to say that you may consider me selfish in placing so

much credit to the promoters of poultry shows. They are, no doubt, ready to accept such honors, and in my mind are fully entitled to all, and in a good many cases to my knowledge those honors were but few in compensation for services rendered. But poultry men are not a selfish class; they love their calling, and accept all due reward where the needy wherewith is not forthcoming.

I must here pause for a few moments, and also do honor to our worthy friend, the Minister of Agriculture, Hon. John Dryden, to whom we owe our present condition of prosperity, as well as our future prospects. Our united efforts would not have proved such a boon, had it not been for the timely and substantial assistance rendered the Poultry Association of Ontario, by our honorable friend the Minister of Agriculture, to whom is due the financial aid given this Association by the Ontario Government wherewith to further the interests of all poultry breeders and agriculturists alike. His personal visits, and the general interest he has taken in our welfare, is but an index of his good-will to all lovers of the "feathered beauties." May he long live to be a supporter and friend of this noble cause, and may his energies in the future be rewarded by a two-fold Government grant to uphold the Poultry Association of Ontario.

Before giving you some hints and facts regarding poultry culture, allow me to extend to you all a most hearty and cordial welcome to this our town of New Hamburg, Ont. On the first poultry exhibition, under the patronage of the Ontario Poultry Association, I sincerely trust that the reputation that our town has gained, by its three successful local winter shows, will be more than fully upheld by all who have favored us by their presence at this, our first exhibition, under a Government grant. May you have a pleasant time, during your short stay with us, and when your labors are ended I know you will carry with you to your homes the good wishes of the people of New Hamburg. Such parting will be, indeed, sweet sorrow.

Houses and Runways. Under this heading it will be almost impossible for me to lay down any special rules for poultry houses, yards, etc., without knowing the locality. I will, however, attempt a few simple methods, which may be a guide to the intending poultry breeder. I do not consider any one soil in particular a necessity in successful poultry rearing By all means have your grounds well drained, and this can be accomplished by using sand and gravel. The hen houses should have a southern exposure, and open into run-ways, where grass is plentiful, to which the fowls should have daily access. The advantage of a good run to hens is well understood; such exercise including the discovery of worms, insects, etc., are an essential necessity in egg production. I prefer wooden buildings; they are not liable to be damp, such as stone or brick houses, and afford free circulation of air. The roofs of such buildings should be thoroughly waterproof. Light should be admitted by windows facing the south, in order to get all the morning sun possible, as *light, air* and *sunshine* are three essential necessities in promoting healthy fowls. The floor of hen houses should be of dry earth, well beaten down, and kept perfectly dry. A pen containing one rooster and six or eight hens should be 12 feet high, 10 feet wide and 10 feet long, and the runways 10 feet wide and about 15 feet long.

The divisions between these pens and runways should be of wire (2 in. mesh) 5 feet high, and boarded up 2 feet from the ground to prevent the cocks from meeting each other, as such meetings generally result in torn combs and broken toes.

Each yard should have water vessels that feed automatically and are raised sufficiently from the ground to prevent fowls from using such as foot baths. The cleaner you keep the water the better for your fowls. A small covered shed in the runway containing a dust bath composed of road dust and coal ashes is necessary in keeping away vermin. This shed also gives shelter to fowls in rainy weather. Keep your fowls warm in winter and cool in summer, and under all circumstances exercise cleanliness, as such is next to godliness.

Another necessity in a poultry house is a moveable perch in form of a trestle from one to two feet high, according to the size and weight of fowl, made of 2x4 scantling, upper corners being rounded. High perches or roosts for heavy fowls are a mistake, as they injure their feet while descending. Small round perches cause crooked breast bones and other bad defects. Nests for laying fowls can be arranged on the floor of hen houses,

divided by wooden partitions, and should be placed in a secluded spot, as a hen does not like to be disturbed while laying any more than a poultry man does while he is saying his prayers. The average weight of a hen's egg is 2 ounces. I might say for Brahmas, Langshans and Cochins, no roosts are necessary, as they prefer to sit in a place well littered down with straw. Having now described the hen house allow me to say a few words about food.

Food for Poultry. On this point I will say that by all means buy and feed the best grain you can obtain. Good food is positive economy. The best food is that which gives the most of what nature demands for supplying muscle, bone and fat. I do not profess to be a chemist, but merely suggest that we should make ourselves fully acquainted with the different feeding substances. Feeding for eggs is one important point, and feeding for meat is another. Feeding food that contains fat and heating qualities will not produce eggs, as there is no egg producing qualities in such. For instance, corn contains about 90 per cent. of heat and fat, therefore do not feed it for producing eggs, but only use it for keeping your fowls warm during winter nights and for fattening purposes. Oats, barley, wheat, chopped hay, second crop of clover, meat scraps and vegetables, all steamed or cooked and fed when cool, form in my estimation the best egg producing food. All these fed sparingly and judiciously will bring good results during the cold weather. In summer time coarse grains and plenty of exercise in grassy runways, or fields will be sufficient.

Some breeders prefer to feed in dishes. I do not. Poultry prefer to pick their food off the ground. Sand and gravel being picked up along with the food aids digestion and produces shell for the egg. Broken egg shells and oyster shells made brittle by burning and then grinding them are also useful in egg production. An egg contains 1¼ oz. of concentrated food, made up of lime, iron, soda, sulphur, magnesia, phosphorus, oil and albumen. The hen has been represented by a certain writer as follows: "The hen is the grist mill, the crop the hopper, and the egg the grist, put up in small white bags."

Buckwheat and hemp seed fed in small quantities will produce eggs early and in abundance; the latter fed during the moulting season greatly strengthens the fowl. Linseed steeped will produce lustre to plumage. Boiled rice forms an agreeable food and boiled potatoes as well. Change of diet suits all classes of fowls and should be one of the chief characteristics in poultry feeding. Fowls are by no means prohibitionists, and such when suffering from debility will occasionally enjoy and rally when fed with bread soaked in ale, beer or wine. Many a dainty dish is composed of bread crumbs and other table scraps, and very often assumes in disguise the name of pudding. I often think it would be a mutual benefit to men and fowls to allow the latter to eat the crumbs in the natural state, and the former to dispense with the puddings.

In conclusion on this point of food and feeding, allow me to advise all poultry fanciers not to be stingy with your fowls, but at all times use the best food, as it is in reality the cheapest, and when the dreary winter months have passed away and gentle spring makes its appearance you may trust a good deal to nature for the food supply.

Hatching. This branch of poultry culture is often attended with disappointments, and I will attempt in as brief a form as possible to describe the best means of guarding against such. Here again the law of nature manifests itself. When a hen steals her nest most generally in some secluded spot unknown to anyone but herself, in nine cases out of ten she will in due course come along some fine morning with a family of healthy chicks. To what do you attribute such success? She had no special care given her by her owner, no dainty food offered during her state of confinement, in fact she was considered lost, but, like the prodigal son, she returned and surprised everyone with her happy family. Now, gentle hearer, I will explain why this mother of the "feathered beauties" had such phenomenal success. She was governed by nature in every respect. She made her nest on the damp ground, went in search of food early in the morning before the dew was off the grass, and naturally returned with saturated feathers, upholding the necessity of dampening eggs daily, if successful hatching is desired. This mode of hatching was continued for 21 days, when she was released from prison and made her appearance as a proud and devoted mother of a brood of naturally hatched chicks. We often hear of eggs not hatching, although there have been birds in such. This is caused by not

dampening the eggs. By neglecting this precaution the inner membrane of the egg becomes so hard and dry that the poor little prisoner cannot make his escape, and naturally dies a miserable death. A good deal of blame in unsuccessful hatching is put down to bad weather. This is easily remedied by using the proper hen houses, as described in the beginning of this essay. Eggs intended to be set should be carefully collected and handled, place them pointed end downwards in bran or oats, marking date on each egg ; the former prevents them being shaken, the latter only being necessary when you send eggs any distance, as well as giving age of egg.

Now, prepare your nests. Use earth or sward for bottom, sprinkle with sulphur or insect powder, then place some soft straw in same. Be careful in making your barrels or boxes deep enough, so as to prevent one hen from seeing the other. Place the eggs therein, and, next the hen, being sure beforehand that the hen is really broody.

In summer time place 13 to 15 eggs and in winter only 9 to each hen. By setting several hens at one time an advantage is gained by being able to put all chicks under one hen as soon as they are hatched, and adding others to her flock. This is in cases where eggs hatch irregularly. Always have a separate place for your hatching hens. Take your hens off their nests daily, giving them a half hour's exercise, at same time feeding and watering them. While this is going on examine the eggs in the nests not forgetting to dampen them, by using a small brush dipped in water. Hens usually return to their nests of their own accord. Should they act stubborn assistance must be rendered.

Never remove chickens from their nests and place in baskets before the fire ; there is enough heat in the hen's body to keep them warm. Remove broken eggs and shells from nests and after 12 hours of undisturbed rest with their mother you may feed them, using crumbs of stale bread. Give the little wanderers a run on the barn floor, and then return to nest. Repeat this for two or three days, then put them in a coop by themselves. Hens are more trustworthy than pullets as setters. Brahmas and Cochins are excellent setters. Artificial means for hatching are considerably used and with apparent success, but to my mind I prefer the natural mother.

Handle your hens carefully during brooding time, extend a helping hand, coupled with kindness to the young brood, and your success in raising and hatching chickens will be assured.

Chickens. I will now ask your attention to a few remarks on chicken raising. About two days after the arrival of the little strangers, proper feeding becomes another matter of consideration. For the first week I would recommend grated bread, the yolks of hard boiled eggs, and oatmeal mixed with water. For the second week, wheat tailings or any small grain. For water vessels use shallow tins or dishes, as deep dishes are dangerous to the young brood. Lettuce, onion tops and cabbage are relished by all young stock. Feed often, the mother being confined to her coop, the chicken is entirely depending upon outside aid. This part of poultry culture I can mark as my happiest time. About this time the chickens become objects of great interest, and many a happy hour can be spent among them. How eager we are that they should succeed How anxiously we await the development of points, and from that moment they are marked birds, and receive special care and attention ; and if there is any chance of favoring them with a better coop, a better meal or a better runway, they will not be long wanting same. Oh, if only poor children were cared for as well as those birds intended for exhibition. The chicken's progress, however, is similar to Pilgrim's Progress, it being beset with many dangers and difficulties.

The month of May should find our yards stocked with well grown chickens. Never crowd your stock ; give them abundance of room. Pullets should be kept by themselves, if you desire a good sized brood, until you require them to be matched for exhibition. Pullets continue to grow until they commence to lay. Cockerels will not fight if the pullets are absent. It is here where chicken nature differs from human nature.

General Treatment. Complete liberty to and good feeding with fowls would cover this part of my reading, but such is not possible in all cases. We must here again follow as closely to nature as possible in the treatment of our pets. Fowls are almost grazing animals, and collect in large quantities grass and green food, and where it is impossible

to grant them complete freedom, give them at least one hour's run daily in some field, orchard or if necessary in a garden. This would be sufficient to keep them in good health and create some happiness, even if it cost you some little trouble and expense. Great care must be exercised in not allowing two broods to enjoy this liberty together, as such would destroy a season's hopes. Never allow different varieties to mix ; the purity of your first, and even the second hatch would be doubtful.

Exercise a systematic form of treatment, and pursue same with vigor, regardless of sunshine or rain, cold or heat. Not a feast one day and a famine next. Never feed in haste, for like children, fowls must have their likes and dislikes well studied. Well formed, healthy and spirited birds should form a breeding pen. And now I must favor Brigham Young's policy of bigamy, when I say six wives is a necessity, or as a matter of advantage may be reduced to four only. The strongest chickens are the results of mating a cockerel with old hens. Avoid breeding from closely related fowls, the result being small delicate chicks, which easily fall victims to all diseases.

The cost of keeping poultry may be reduced by having an annual sale (before breeding seasons) of single birds, or pens, for exhibition purposes. You can also reduce your expenses by selling eggs for setting. Don't be afraid to advertise anything you have for sale. Don't sell any of your eggs to your grocer or store keeper. The same would find a ready buyer, and the result would be a good chance of your being defeated at your own local shows by your own stock.

Amateurs should only keep a few fowls of high grade. This would only be for amusement and study, and would not result in any loss ; if successful, I would then advise trying it on a larger scale. Here we meet two extremes ; it pays either to raise poultry on a very small scale or on a very large scale.

Before closing my remarks on treatment for fowls I will say a few words to our farmers. In the spring buy your eggs from some local breeder, in whom you place confidence (as all are not to be trusted). Set every egg, keep all the pullets and sell or kill the cockerels. In the fall you will have a fine lot of hens, which will lay all winter. In the fall buy a cockerel of the same breed but different strain, and you will be fixed for that season, and so on. In this way you will supply your stock for several seasons at a reasonable cost.

I would here recommend the Brahma or Cochin fowl ; they are good layers, they sit early and make good mothers. Besides their weight is almost double to the smaller fowl at the same cost of feeding. Did you ever take notice of the fowls brought to our markets, generally displayed in front of our stores ? Some of them are not entitled to the name of fowl, with long black legs, narrow breasts, etc. This is not the result of poor feeding, but the result of poor breeding.

The barnyard, as before stated, is the paradise of poultry, and nowhere can fowl live and prosper in greater comfort and plenty. Let the farmer test my advice by his own practical experience and I am not afraid of the results. I often wish that our business men would introduce the system of buying eggs by the pound instead of buying by the dozen ; the result of this idea would mean larger eggs, a mutual benefit to buyer and seller.

Poultry ought to pay the farmer if anybody. Some farmers say, "I have no time to devote to poultry." My dear fellow, trust that portion of your work to your wife, if you are fortunate enough to have one, and then look for good returns. "Woman is the chicken's best friend," and they will prosper under her care when man fails.

"He prayeth well that loveth well.
Both man and bird and beast."

Fowls for Exhibition. The only correct way to obtain the value of any fowl is to exhibit same at some good local show. It is there where the true merit and value is determined. It is there where you meet in competition your fellow breeder, and where the prizes and medals are awarded, and where honors should be honorably and faithfully awarded, and may I soon see the time when all judging shall be determined by comparison, and not by scoring. How well does the professional breeder remember his first experiments in those places of competition. How he left home with his beauties, all, in

his imagination to be birds of Paradise, but alas, on his return he found to his great regret, he only had a lot of geese. But, such is nature. The best must win, and here might be applied the old golden rule, "If at first you don't succeed, try, try again." There are many causes for failure in not succeeding in obtaining prizes at poultry shows. Ask some of your poultry fanciers and breeders who have "weathered the storms" and they will tell you, you must get a better strain of blood in your breeds. Contribute fresh recruits to your stock, and await the time, with patience, and at the end success will crown your efforts. There is nothing like patience and perseverance. Success is naturally more self-pleasing than defeat.

Select your birds for exhibition from infancy, feed properly, and when they have attained some good points, then mark same with different colors of ribbons on their legs, make a memorandum of same in your pocket dairy, as a guide for the future, and about a month before show, give them extra feed and care. High feeding now becomes a necessity to bring the fowls to such weights as now required in first prize poultry in this country. You may use some linseed to give lustre to plumage, toast and bread soaked in ale to give life, courage and strength. It is here where the scales play a most important point, many a bird in appearance was heavy, but was found wanting when put in the balance. Don't trust your eyes in judging the weight of a fowl ; feathers are deceiving.

Here, allow me to say a few words regarding our poultry judges. These gentlemen have a most arduous duty to perform, and as a rule do not receive enough credit for their labors. I have always placed implicit confidence in these gentlemen during my short poultry career, in regard to their judging and decisions. Many an exhibitor, I am sorry to say, entertains a grudge against our judges. Why ? Simply because he did not win. Allow me to say to such, that our judges are but human beings, and are liable to err. I don't envy their position. Let not the amateur think that his birds will be winners for a certainty. He has much to encounter, viz., size, weight, color, comb, tail, feet, hackles, and in addition symmetry and apparent healthy appearance. See that your birds are properly entered, give age and variety, and also see that your birds are placed in the coops allotted to them. On the day before your departure for exhibition wash your fowl, both feet and body. If fowls are white, with luke warm soft water, using soap rubbed on a piece of flannel, being careful to wash feathers downwards so as not to break them, then dry the fowls with soft cloths and shut them in their coops, giving them plenty of straw and soft food, as hard grain is apt to cause inflamation, while cooped up or while travelling, or during exhibition time. When your birds return home use the same precaution and feed carefully for a few days on bread soaked in ale or water and administer a teaspoonful of castor oil to each bird, after this they may assume their usual diet. This same prescription or treatment might have been applied with good effect to some of our Canadian poultry exhibits during and after the great World's Fair at Chicago.

For shipping coops I would recommend those being circular in form, lined on inside, and sufficiently high for birds to stand erect. The square coop so much in use allows the bird to creep in the corner and destroy their feathers. Do not put strange birds together in ene coop—they will fight and destroy each other's plumage, combs, etc. After close of exhibition and when you have returned your fowls to their respective homes, select some fine day and thoroughly clean your coops and put same away for another occasion.

Diseases of Poultry and their Remedies. On this subject I will endeavor to be brief as well, and only give my hearers some good remedies that have come under my observation, and as there are no graduates as Poultry M.Ds. from our universities I trust I will not interefere with the profession in this line of business. Whatever may be our experience or ability in treating the many diseases so prevalent in poultry life, let us do our duty, and study to relieve the sufferings of our domestic animals and not let them perish unaided. Take the disease in time and you may ward off a great and serious malady. There should be an hospital in connection with every poultry house, to which a fowl on its first symptoms of illness should be removed. Such fowls generally become an object of dislike to their companions, so you will see that the separation of a

sick fowl from its healthier brothers and sisters will be a twofold benefit. The older fowl are subject to gout, a great many dying during moulting season. The younger fowl are victims of gapes, roup, leg weakness and bad feathering.

Roup if taken in time can be cured. Remove the patient at once to the hospital, give a teaspoonful of castor oil and in a few hours later give one of Guest's Roup Pills, take the scale off the tongue, repeat the dose of physic every morning for a week, and feed soft food only. The symptoms in roup are a hoarseness and catching in the breath, like a bad cold. In severe cases where discharge from the eyes and nostrils take place, stronger remedies must be used, viz., take:

1 drachm dried sulphite of iron (in powder),
1 " capsicum " "
Enough extract of liquorice to make about 30 pills.

One to be given three times daily for three days. Then mix ½ ounce of sulphate of iron and one ounce of cayenne pepper, in a fine powder, and then mix a teaspoonful of these powders with butter and divide into ten equal parts, one part to be given twice a day each morning and evening. Wash the eyes, mouth and nostrils daily with vinegar, and a few drops internally will not harm, as it will remove any mucus that may collect in the throat. This disease will take its full course, and if your bird is not well in a week it will be dead. This treatment, I would advise to be used only on valuable fowls. Any worthless creatures get rid of as soon as possible.

Gapes usually attack young fowl, and is occasioned by small worms in the throat. Use a small feather, insert same in windpipe, turn round quickly and withdraw, and you will draw up the parasites with it. Give occasionally a small piece of bread soaked in spirits of camphor.

Croup bound fowls: If you want to save the bird make an incision in the throat, remove the undigested food and sew up the wound with a silk thread; give a dose of castor oil and feed on soft food until wound is entirely healed.

Hens dropping their eggs on the ground away from nests, require treatment. It often happens that they lay soft eggs. A dose of castor oil in both cases is beneficial, and a change of diet must take place, the hen in these cases being too fat. Diarrhœa in fowl is caused by feeding too much soft food. Remedy: Boiled rice with a mixture of chalk and cayenne pepper. This will check the most serious case.

Leg weakness is generally caused by over feeding. The body becoming too heavy for the legs. Citrate of iron dissolved in ale and added to food will cure this disease. Bathing the limbs in cold water is beneficial as well. Fowls afflicted with corns: give them a chance in grassy runways and the corns will soon disappear. If the combs of fowls become black and the bird faints, bleeding the foot will often affect a cure.

For a poisoned bird, give two or three spoonfuls of castor oil at once; in half an hour give a strong infusion of warm coffee with sugar (no milk), put the bird in a warm place; in six hours repeat the dose.

In conclusion, allow me to thank this great gathering for their kind attention and patience rendered during this lengthy composition. These pages just read, I hope will meet with approval. I have tried to explain away some difficulties, and correct some misunderstandings, and trust I have added some new ideas in poultry culture.

Some portions of my reading may necessarily treat of the same subjects as others. I make no pretence to be scientific, but have tried to make this essay, as far as practicability is concerned, interesting and instructive, and have given all arguments regarding poultry culture fair play.

I can truly say that during the time I have reared poultry I have ever found the pursuit to be a labor of love, and, like virtue, its own reward, and I trust that those whom I have addressed may have had the same experience.

THE CANADIAN POULTRY INDUSTRY.

By W. R. Plum, New Hamburg.

I thank the Association for the honor conferred in asking me to address this meeting, though I cannot say anything on the practical side of the subject that would be of any value to you or that any of the gentlemen here present does not already know. I am not directly interested in the poultry industry, but as a Canadian to the manor born I can speak with pride and satisfaction of its importance and value to the people of Canada and of its rapid development during the past twenty years. In those twenty years it has increased beyond our most sanguine expectations, and become an important factor in the trade and commerce of this country, and notwithstanding its extension it is capable, we believe, of reaching proportions tenfold greater than its present volume. The Provincial Government, fully alive to the value of the trade to this Province has wisely, we think, materially assisted in promoting its expansion by an annual grant of $900 a year to the Association. This action on the part of the Government, I know, will be commended by all present, as they are assisting in fostering and building up an industry, the surplus of which realizes to the people of Canada no less than between one and two millions of dollars annually.

In looking over the public records I find that in 1868, just 25 years ago, the total value of eggs exported was only $206,000; but the trade inreased by strides and bounds each and every year until in 1884 it reached the prodigious sum of $1,960,000 and remained about stationary at that sum until the year 1888, when the eggs sent out of Canada brought back into the pockets of our people $2,122,000 and $2,159,000 in the year 1889. Since the year 1889 there has been a falling off in the value of the export, which is partly due to the falling off in quantity shipped as well as in price realized. I find that the average price realized in 1883 was 16 8-10 cents, while this year the average has been 14 cents. Since the year 1889 the value of the egg export has been between one and two millions; in 1892 it is set down at $1,089,000, the number of eggs exported being 7,931,000 dozens. I have not the figures for 1893, but I find that the British Board of Trade returns show that in January, 1891, they imported from Canada only 450 dozens, and in January, 1892, only 11,600 dozens, while in January, 1893, they took from us no less than 43,000 dozens.

In speaking of our possibilites in this industry, let me say that while we now export about 8,000,000 dozens annually that Great Britain imports 100,000,000 dozens at a cost to her people of about $15,000,000 a year. In other words, if we could supply Britain with her eggs we would instead of realizing $1,089,000 receive an annual return of $15,000,000. It is this thought I know that has prompted the Provincial Government to lend with their presence and their grant so much valuable aid in assisting us to secure the greatest possible amount of that trade.

I find that up to the year 1891 our surplus eggs went to the United States. In that year Britain took only 83,000 dozens, but in 1892 our trade with Britain increased by 3,338,000 dozens, amounting to half a million dollars, and our trade with the States fell in the same year from nearly $2,000,000 to $494,000, the result, as you are aware of the almost prohibitive McKinley tariff.

But as that tariff is likely to be removed in the near future, those engaged in the industry can look forward hopefully to two great markets where all they can produce may be sold at profitable prices.

In speaking of the enterprise of our poultrymen, I need only tell you that the public records I show that they have searched the whole earth for breeds wherewith to improve the stock—they have imported from Hong Kong, from Japan, the United States, Britain, the British West Indies and from China, and the splendid exhibit here to-day shows us that their labors have not been in vain. It is an exhibition that any of the old nations might well be proud of. In conclusion let me thank you for your kindly hearing. As a citizen of this place I bid you all a kindly welcome here to-day. I congratulate you on having brought together so many representative men from different parts of the Dominion.

I congratulate you on having in your midst so distinguished a person as the Hon. John Dryden, Minister of Agriculture. I trust that your visit to our town will prove both pleasant and profitable, and that you will carry away with you a good impression of our people, as I know you will their best wishes for your future prosperity. And I further trust that your impression is such that you will decide to bring back the Provincial show to us at no distant day.

Mr. Dilworth: I wish to say that the Association is in great need of coops to transport birds from one place to another. It would take about $500 to provide coops for one thousand birds. We cannot spare the money for this and give the prizes we are now giving and bear the expenses incidental to our show. I have to ask the Minister of Agriculture to consider whether he cannot see his way to give us $500 for this purpose. At present much of our poultry cannot be sent for the reason that we are not so provided.

Hon. John Dryden: I am, of course, very glad to hear any suggestions of this kind, but I fear Mr. Dilworth puts altogether too much honor upon me. He says, "If the Minister of Agriculture can see his way" to do so and so. But allow me to say that I have only a very small part to play in it. I do not handle the money of the Province. I suppose you are all represented by somebody in the House—it does not make much difference on which side:—if you will go to your representatives and say, "We need more money for this purpose," and they will come to me and urge your demands, it will be comparatively easy. Are you prepared to work on that line? So far as I am concerned your Association and every other association has my hearty sympathy. I am aware that if you had proper coops your birds could be easily transported and shown to much better advantage than at present, but I am not sure whether under the present state of things it would be safe for me—unless I am backed more strongly than at present—to say to the Legislature that I want $500 for this purpose. Many would say, "You are going too fast, let them help themselves" Other associations would say, "You are giving extra assistance to the Poultry Association, we want it too." One matter has been suggested here that I think ought to be impressed. I think you are correct about the desirability of selling eggs and poultry by weight. I believe that the question of progress rests very largely on that question. It is the same way with poultry products as with butter. What do you find in some of our towns in reference to butter? No matter what its quality is, it all sells at the same price. This means to discourage every attempt made to educate the people who are manufacturing the butter to produce a better article, for the man who takes little or no care gets the same price as the producer of the superior article. How does it come to pass that a man with a heavy chicken gets no more than the man with a light chicken? What are you going to do about it? You acknowledge that it is unfair, but will you go away and let the matter stand at that? Cannot you as an Association be useful along this line? Suppose you pass a resolution before you leave, making a declaration of your members on this point? That would be some help. But cannot you go further? Cannot you undertake to inaugurate a conference between some of the egg packers of this country and the egg producers? Say to them "It is to your interest and to ours that you should buy these articles by weight" This is one of the ways by which the Association can make itself useful. If you will take this matter in hand, I venture to say that in the near future you will have worked an entire revolution along this line.

Mr. Haycock: With regard to selling eggs and poultry by weight, I think that the difficulty will remove itself as soon as the industry becomes of such importance that shippers begin to buy. It is in markets where the retail trade is done that this difficulty seems to exist. If any action be taken in the matter I would suggest that it should be to place on the Ontario Statute book a clause authorizing towns having markets to pass by-laws regulating the way eggs and poultry should be sold on their market. That would give the people a chance to try it, and would educate them up to some method of overcoming the difficulty.

Mr. Bender: If the Association would memorialize the Farmers' Institutes throughout the country and ask them to co-operate with us I think it would accomplish a good deal towards remedying the matter. In the town I come from (Niagara Falls),

there is never such a thing heard of as selling poultry by the pair. I have never sold a pound of poultry there at less than 10 cents, and it is generally 12 cents. I am greatly surprised to hear that throughout the country poultry fetches such low prices as I have heard stated to-day.

Mr. BURN: I may say that in our neighborhood one man recently shipped about 5,000 turkeys from Ingersoll and 6,000 shortly after from Woodstock. He paid 8 cents per pound for them, bled with the feathers on.

The meeting then adjourned.

POULTRY FOR PROFIT ON THE FARM.

By Mr. JOHN GRAY TODMORDEN.

In dealing with the above subject I feel that I should forget for the time being that I am a breeder of fancy poultry and give only a true, straight opinion as to what I consider the most profitable fowl for farm purposes, consequently I will endeavour to evade as much as possible the common error most poultrymen make when writing up poultry articles, of seeing only the acme of perfection for any use in one particular breed. In the first place I do not consider that any variety of thoroughbred fowls kept straight are the best for the farmer. There is a great difference between the average farmer and the poultry-fancier. The latter must of necessity keep pure bred stock and exhibit the same to win any measure of success; besides this as a rule the fancier has very little room to raise stock on, and consequently must endeavor to raise quality from a feather point of view in order to obtain any reasonable benefit from keeping fowls. The farmer, on the other hand, has unlimited space and can afford to raise large numbers of fowls for market purposes, a branch of his farming which, if properly managed, is bound to give him as good or better returns than any other on the farm. The question that presents itself is, what are the most profitable classes of poultry for the farmer too keep, hens, geese or turkeys?

Before going farther I will give my reasons for saying that I do not believe any variety of fancy poultry, so bred, best for the farmer. The farmer's fowls must necessarily be of a hardy constitution, as in nine cases out of ten they are not given the comfortable quarters or careful attention given by the poultry fancier to his flock. Again in-breeding certainly deteriorates utility and all varieties of fancy fowls are more or less in-bred. Besides this the farmer is not so likely to be as careful as a fancier in his selection of male birds for out-breeding, so that his variety of fancy fowls would in all probabilty in a few years dwindle into a flock of miniature culls, and be of no use whatever as a fancy fowl and very little good for any other purpose. Living as I do in the midst of farmers I can assure you that very few farmers are imbued with the spirit of the fancier and could not be convinced that there is any money in going to all the care and trouble which most poultry fanciers most necessarily go to, to win any measure of success. A hardy, quick-maturing fowl is the most suitable for the farm, therefore I would recommend as a start a Wyandotte cock on Plymouth Rock hens or pullets as a foundation of a flock of fowls for that purpose. Each year I would suggest a strong vigorous cock, Plymouth Rock and Wyandotte alternately to keep up the quality. About every fourth year I would use Leghorn cocks to these cross bred hens to aid the egg product. I will venture to say no flock of pure bred fowls will give the same satisfaction as birds bred in this manner, for besides keeping up in size and hardiness they will show none of the weaknesses high bred fowls are subject to.

It will be seen by this that while I do not advocate fancy fowls for the farmer I believe in the use of thoroughbred males to keep up table and other qualities. Why? Because on the American continent a yellow-legged, yellow-skinned fowl is the most marketable and that is why I favor the varieties named. Besides having these qualities

the Wyandotte and Rock are great winter layers, and the Leghorns would help to check a little their tendency to incubate and help considerably the egg product in summer. Moreover should a mongrel male be used or even a thoroughbred male with dark legs the flock would at once become inferior for table purposes.

Having given what I consider the most useful varieties for the farm, and my reasons, I would advise the farmer to watch the market to dispose of his stock to the best advantage. Very little work can be done on the farm during February, March and even April, so that the farmer could devote some of his spare time to raising spring chickens which could be marketed at ten weeks old at extra good prices, and form a very profitable business while the crops are growing. It is a great mistake to raise late chickens for market purposes, during April, May and June. Spring chickens ten weeks old will sell readily at 75 and 80 cents per pair; whereas chickens hatched as they usually are on farms in June and July, and sold in November and December five and six months old, sell at from 25 cents to 50 cents per pair. Therefore it behooves the farmer to raise early chicks, for early pullets makes the best winter layers, and winter eggs are decidedly the most desirable, being three times the value of summer eggs. I do not expect every one present to side with my views on this subject, nevertheless the farmer will do well to follow them out. Eggs and meat are the returns he looks for from his fowls and not fancy prices.

There are many farms upon which geese may be profitably reared. Water beyond enough for drinking purposes is not required. The chief necessity is the possession of an abundance of grazing land. This need not be valuable, but such as is met with upon hundreds of farms in this country. Rough, rocky hillsides will afford geese excellent pasturage and, as these birds are close feeders, cropping most species of plants close to the ground, noxious weeds and other undesirable vegetation will be kept down and eventually choked out. In this way geese form a good second to sheep in the reclamation of wild waste land. The great inducement to the rearing of geese is the fact that they can be produced so cheaply upon the many wastes of the farm. The main growth can be made on grass alone, only a small quantity of corn being required for finishing or fattening off. Spring goslings should dress at least at 10 pounds a piece by the holidays when roast goose forms a dish for many of our people. The Toulouse and Embden are probably the best, as they grow to a large size and are decidedly handsome in appearance. Farmers with waste land on their farms should not overlook the fact that there is money in geese.

Turkeys also form a very profitable branch of poultry-raising on the farm, and always find a ready market at a good price. There are thousands of acres of waste land on farms in this province that could be utilized for poultry-raising and on which turkeys and geese would find a living without being any expense whatever to the owners unless just for a few weeks before marketing.

I have attempted to the best of my ability to give what I consider the best poultry for profit on the farm, I would advise the farmer to be more careful in the matter of housing fowls in winter, and in collecting and storing away the droppings, which can be used to great advantage as a fertilizer. I would also advise every farmer to subscribe to a good poultry paper, as many valuable hints are continually to be found in its columns to those keeping poultry. Also endeavour by good management to obtain the best results by doing which, we shall doubtless hear more reports that poultry are a profit on the farm.

REPORT ON TWENTIETH ANNUAL EXHIBITION.

By Mr. Sharp Butterfield, Windsor.

The twentieth Ontario show has passed and gone, and it was considered by far the best collection of birds ever brought together in Canada. And from my own memory, for I have judged at the Ontario show since its inception, I must say I have noticed the classes of birds, and the improvement is so marked that one would almost think he was at Crystal Palace or Birmingham show, and in nearly every class there were birds which would not pass unnoticed even at those two leading shows of England.

Light Brahmas. Of course, the American light Brahma and the English light Brahma, according to American and English fanciers, are much at variance. While we don't require the heavy leg and toe feathering our cousins do, nor yet the length and fluffiness of feather and short backs, still, my eyes have become so educated that I think I see more beauty in a first-class American light Brahma than I do in our cousins' type. The American light Brahma has filled the bill for a long time as the best general purpose fowl in this country, and at present may not be in the lead, but still it maintains its popularity amongst fanciers, that its beauty is worth quite a consideration, while the English Brahma would require considerable more care to keep the feet and leg feathering in show shape, and probably would not be so good for practical purposes. And still, to be an A No. 1 light Brahma, the feet require graceful middle toe feathering, which hides the toe, and which adds finish to our artistic Brahma. All the winning light Brahmas were really grand specimens, especially the first prize cock and hen. The cock lacked foot feathering, and would have been better if the striping in neck ran higher up towards the head, and a little heavier striping would make him rank pretty high. The first hen was a model light Brahma, with no Cochin cushion or fluff. Her plumage was grand, the white as white as snow, no creamy tinge, though she has not standard requirements for flights, but has got a really good wing, so good that several judges have scored her one for wing; tail just about perfect in color, with beautiful black tail coverts and finely banded; her hackle very glossy and well defined, but feathers hardly pointed enough or would call it a perfect neck. What a lovely low comb, with distinct serrations; had to cut one because was not standard size. But, oh! her feet; of course, it would take a lady's foot to be more perfect. Second was a good hen, but more after the English type, too loose in feather. Third, a grand hen, but a little lighter in tail and not so good in neck; still they looked like three sisters, for they were all full in breast and body and beautiful concave sweep from shoulders to tail. Oh! if George Purdue had been there, he would have talked of entering an action for infringement of tail and tail coverts. The first cockerel was a very large young bird, and so much resembled first prize hen that one would feel sure it was his dam. The second prize cockerel, the most perfect model I ever passed upon. Had his neck been a little heavier in the black striping I could have pronounced it perfect; tail was an ideal both in color and shape, and probably as perfect coverts as we shall ever see. Third prize cockerel, grand in surface color, but not so good in shape of body and breast, nor yet so good in hackle and tail, and lacked finish in foot feathering, still a good bird. Several fairly good birds had to be left out of the prizes.

Dark Brahmas. First prize cock, a beautiful bird both in shape and color, and he lacked for want of more dense striping in hackle and saddle, but the whiteness of his plumage was very fine. Same fault with the second and third prize birds. I only noticed one bird with any red in wing, and that one was very slight. The hens, especially first prize hen, were grandly pencilled all over, and the pencilling ran well up in throat. Second prize hen, good, but much smaller in appearance. Third prize hen, a good hen, but lacking in size. I noticed one cockerel with a crooked back, so had to disqualify him. One of the standers-by said that was first prize cockerel at the World's Fair. I said it might not have been so prominent then as now, and the cockerel got the benefit of the doubt. First, second and third looked much alike in color, but the best developed birds got the premiums. First pullet was grand surface color, lacked evenness of pencilling on back, but she was good Brahma-shape and nicely furnished feet. Second prize pullet, a grand young bird, but the pencilling on breast was cloudy and near the throat looked like small spangles. Third prize pullet was grandly pencilled, but lacked ground color. I am sure the dark Brahma class, as a whole, was the best I ever judged at the Ontario show, and about the most of that variety.

Buff Cochins. First and second cocks in great shape; both looked as if they had come from some first-class milliner, for the length of tail coverts was so immense that one would think they had cut off a few feet of ribbon too much and they were bound to use it up, so used it on coverts and sickles, and the color was one better than the standard. It was a rich, clear, deep golden buff, with immense foot and leg feathering. Third prize bird, good, but much shorter in feather. The first and second prize hens were immense

in size and very sound in color—just about standard color. They were clear buff, with grand Cochin-shape. Third prize hen, a good bird a year or two ago, but too small to go into such large and good company. First prize cockerel, similar to the first and second prize cocks in every particular. The second and third prize cockerels were great birds to score for color, and, if they had been more massive in appearance, I think I should have had to award three first prizes. I noticed a beautiful model for a Cochin cockerel, but most of his tail was gone, which marred his beauty. Pullets, first, second and third, large and about perfect in color, and there is not much wanting in them, only a little higher in cushion would make them nearer perfection. Oh! if Theodore Sternberg had been at New Hamburg, he would have spent one day sure looking at the buffs, for I am certain our Ontario show never held so many good ones before.

Partridge Cochins. Cocks made rather a poor showing, still there was one pretty good old cock, but the remainder only medium. Cockerels much better. First prize bird the best in shape, but a little too dark in color. The best colored cockerels were lacking in shape, hence had to take second and third places. Hens, one fairly good old hen; balance of class only medium. Pullets—first was a grand shaped Cochin and was pencilled on cushion, and that is nearly always a weak place in partridge Cochins. Second and third, good pullets, but not distinct enough. I noticed quite a lot of light shafting on a good many of the pullets' breasts, and one pullet I had to disqualify for vulture hocks, a very unusual thing in partridge Cochins, but no doubt, bred to our partridge Cochins, it will help us much in getting good leg and toe feathering. Though she be disqualified for vulture hocks, she is worth much more than a bare middle toed Cochin, for in the new standard, bare middle toe on Cochins is a disqualification, and ought to have been so always. I think we find to-day that the partridge suffers more for light leg and toe feathering than any other Cochin.

Black Cochins. Cocks were fairly good. The prize-winning cocks very high in color and very good in shape, and while one had almost too much feather on legs and feet, the other one was lacking; still quite an improvement as a whole. Hens—First prize hen was rich in color and very large, but almost getting too old to do much winning, and if a little higher in cushion would take a real good one to beat her. Second and third prize hens looked small compared to her, still they were better in shape, but not so high in color. Cockerels—The winning cockerels were good in shape and very highly colored, but lacked looseness of feather; still they were good birds, and may yet develop, for they looked quite young. Pullets—The same about them as cockerels, first, second and third all very much alike. Taking the blacks as a whole, they were much higher colored birds than we usually see.

White Cochins. First prize cock a Cochin all over, and pearly white plumage, with grand leg and toe feathering, and, if larger in size, would be hard to beat. Second prize cock not so good in shape, but very fair in color. Hens—First prize hen a Cochin from feet up, but lacks size. Second, very good. Third, fairly good in size, but lacks Cochin-shape. First prize cockerel, a good Cochin, but loses all over for color, being of a yellowish tinge. Second prize cockerel, much better in color, but away off in shape. First prize pullet, I think I judged her at the World's Fair, and Mr. Sternberg made the remark that she was Cochin from feet up. She is certainly a gem, neat head, short in neck, and grand in breast and back shape. Second prize pullet, very similar, and third prize pullet close up. Third was not quite so good in beak color as the other two, but she was really fine.

Barred Plymouth Rocks. Seventy four in number makes quite a Plymouth Rock display. First prize cock, a very good bird, with a nice medium-sized comb, but lacked enough serrations; still he was a really good bird, except deficiency in tail, being short of barring; his breast was very even and very straight in barring, each feather ending with a nice bar. Second prize cock was a good bird all over, excepting breast, being a little on the light side; tail very good for an old cock. Third prize cock very evenly barred, but the bars did not run so parallel as first and second. In most old cocks their weakness lays in tail color, and in balance of class showed their tail was the worst deficiency. Hens—First prize hen was very straight in barring and very clear in color,

and showed none of the brown tinge so commonly seen on Plymouth Rocks; she would have been better if black bars had been a little narrower. Second prize hen very similar, but not so clean in color. Third prize hen grand in barring, but whether from age or being out of condition her feathers showed a slight brownish tinge. There were lots of good barred hens, but the greatest fault lay in the brown and gray tinges. Cockerels—First prize cockerel grand in shape, nice comb, and probably one of the best barred birds in Canada, barred right to the skin, and as parallel in barring as was ever seen on a Plymouth Rock cockerel. If he keeps healthy and well, he is a bird that will often be heard of when shown. Second prize cockerel probably the best combed bird in the show, about perfect in body, back and tail shape, but too light on surface color, still very parallel in barring, and, from outside appearances, don't look near the first prize cockerel. Third prize cockerel, a very similar bird to first prize, but lacked the cleanness of surface color the first prize bird possessed, and not so good in comb. A good many nice cockerels I noticed, and birds their owners need not be ashamed of, though they did not win. Pullets—Probably the best one of the three winners was the third prize one, but the cockerel had so mussed and broke her back feathers that she got a cut of one more than she ought to have had had her back feathers not been damaged. However, first prize pullet was right up, and, having lost one for weight, she had to make the weight or might have been very near a dead heat. I think there were three or four in the 92½ class, and and on looking them over by comparison it was a hard matter to tell which was the best or which to give the preference. The same can be said of pullets as has been said of hens—lots of good ones left out; some showing the brown and others the greyish tinge, instead of bluish tinged plumage.

Games. In Games, the first prize black red cock away ahead, probably one of the best cocks ever shown in Canada. What a pleasure to look at him. The moment he caught your eye he became a statue. His neck would straighten out and his eye would look you right in the eye, with his wings tucked up to his body, his tail like a whip, and his great breast and the wing fronts quite prominent, and his stern was so well cut away that it seemed it was made to be in harmony with his tail; he was a beauty. Second, a fairly good bird, and third the same. First prize hen one of the grandest of bodies, nicely cut away in stern, and tucks her wings grandly to her body, fine in tail, a little on the short side in leg and head, but a grand, good colored black-red hen. Second prize hen not as good. Third prize hen was getting too short on leg, but she had grandly shaped breast and body. I think I made a mistake on hens. One unnoticed hen ought to have been second, which belonged to Mr. Main, and but for the light being so bad I don't think it would have occurred. I noticed in looking over my awards to see if they were all right the second day after the judging that the hen mentioned had only one bad fault, and that was her wings crossing on her back. Cockerels, first prize cock's description would suit the winner all over, only cockerel was not quite so good in color. Second prize cockerel lacks breast and body shape and too long in back, and not hard enough in feather. The third very similar to second. In pullets, first prize a gem. Same description of her as about the first cock and cockerel. I think her the best pullet I have ever judged. Second and third prize pullets both narrow in breast compared to the first prize one, still, rare good pullets, but legs too slender. Golden Duckwings much better than last fall. I saw some new faces which will make quite a mark, health permitting. I liked the second prize cock better than the first, but he had not got quite over his sea sickness. First prize hen very good in style, reachy and good color. Second, fairly good hen, but lacks breast. Third, very similar. Cockerels and pullets were really grand, and even some of them that did not win will probably win some other day or produce winners. Pyles, nothing remarkably good; fair to medium. Brown reds, one grand old cock; the others fairly good. Hens, first prize hen right up. I noticed one hen. I have placed a great many first prizes on her coop. Her legs are getting played out, and she has to give way to something younger. Cockerels, first prize just about as high as he ought to go. Pullets, very good, both in color and style, and had they been in better light and on a lower tier I could have been more explicit.

Game Bantams. In Game Bantams, quite a lot of new faces in chicks, and some really good ones won the prizes. In black red cocks the second prize cock should have

been first but for his mottled breast and body. Second prize cock quite as small, but lacked style. Third prize cock close up. First, second and third prize hens real good ones, excepting third prize being a little dark in color of back and wing. Cockerels and pullets—Cockerels hardly finished their plumage, otherwise good; lots of style and fashion. First prize pullet a little too thick in stern, and second prize pullet should have won, but she had a slight concave back. Third prize a gem, but a little off in color. Duckwings—First and second both good birds, and third not so good in color. Hens—All the winners were in good color and style. First Duckwing cockerel a walk over both in color and make up. Second a good bird, but lacked in wing and back color. Third lacks style. The three winning pullets all good, and will be heard of later. Brown reds—Old birds, pretty good. Chicks—First prize cockerel being more developed caused him to win over the second, though, if all goes well, the second will the first place later. Pyles—The first, second and third prize birds about equal, and with different judges would probably all get first in their turn. Pullets—Winners all good ones.

Hamburgs. The most good birds ever seen together on this continent. The World's Fair was not in it on Hamburgs, though probably one half of them won prizes there.

Spanish. A really grand class, both in old and young, and lots to choose from.

Polands. Ever getting better, and lovers of Polands can see them at New York, where all will exclaim they never saw so good before.

W. Plymouth Rocks. Grand in color, but probably not so good in shape, still, lots of grand birds to choose the winners from.

Leghorns. Right up in G, and many good birds could not get the red tickets.

Langshans. In great force, and I would like some of our Langshan breeders to try their strength in New York.

Wyandottes. All had birds of great merit, especially golden cockerels, of which several had perfect striped saddle feathers without any mossing and very distinct in striping, and grand, well opened, even breasts.

Houdans. Heavy classes, and show a marked improvement. I might say the poorest specimens would have been called good ones a few years ago. Premiums will show those who got the lion's share.

In *Ornamental Bantams*, suffice to say when William McNeil and Richard Oke meet there is always a strong tussle for supremacy, and it always takes good ones to get first places. The scores show quality in other classes.

LIST OF PRIZE WINNERS.

Light Brahma.

Cock.—J. Cole & Co., Hamilton, 91½, 1st; Haywood & Kent, Kingston, 91, 2nd; J. H. Saunders, London, 90½, 3rd.
Hen.—E. H. Donnelly, Sandwich, 95, 1st; Donnelly, 94, 2nd; Haywood & Kent, 92, 3rd.
Cockerel.—Donnelly, 93½, 1st; Donnelly, 92½, 2nd; Haywood & Kent, 92½, 3rd.
Pullet.—Donnelly, 95½, 1st; Donnelly, 95½, 2nd; Donnelly, 95, 3rd.

Dark Brahma.

Cock.—Thorpe & Scott, London, 92½, 1st; Thorpe & Scott, 92, 2nd; W. H. Rowlson, Guelph, 91½, 3rd.
Hen.—Saunders, 92, 1st; Thorpe & Scott, 91, 2nd; Rowlson, 89, 3rd.
Cockerel.—Thorpe & Scott, 94, 1st; C. J. Daniels, 93½, 2nd; C. S. Rennie, Toronto, 93, 3rd.
Pullet.—Saunders, 94, 1st; Thorpe & Scott, 94, 2nd; Rennie, 93, 3rd.

BUFF COCHIN.

Cock.—G. G. McCormick, 94½, 1st; McCormick, 92½, 2nd; F. C. Hare, Whitby, 92, 3rd.
Hen.—McCormick, 94½, 1st; McCormick, 94, 2nd; Hare, 93, 3rd.
Cockerel.—McCormick, 96, 1st; Hare, 94, 2nd; Hare, 93½, 3rd.
Pullet.—Hare, 96, 1st; Hare, 96, 2nd; McCormick, 95½, 3rd.

PARTRIDGE COCHIN.

Cock.—L. G. Pequegnat, Hamburg, 91.
Hen.—Pequegnat, 91, 1st; Pequegnat, 87½, 2nd.
Cockerel.—Pequegnat, 94, 1st; Pequegnat, 90½, 2nd; Allen Bogue, 89½, 3rd.
Pullet.—Pequegnat, 94½, 1st; Allen Bogue, 92½, 2nd; Pequegnat, 92, 3rd.

BLACK COCHIN.

Cock.—McCormick, 93½; W. H. Reid, Kingston, 91, 2nd; McCormick, 91, 3rd.
Hen.—Cole & Co., 95½; McCormick, 92, 2nd; McCormick, 91, 3rd.
Cockerel.—McCormick, 93½; McCormick, 92, 2nd.
Pullet.—McCormick, 94½; McCormick, 93½, 2nd.

WHITE COCHIN.

Cock.—Wm. McNeil, London, 94½.
Hen.—McNeil, 93½; Smith, 90, 2nd.
Cockerel.—McNeil, 92; A. McMeans, 89, 2nd; Smith, 85½, 3rd.
Pullet.—McNeil, 96½; McNeil, 96, 2nd; Emerick, 94, 3rd.

BARRED PLYMOUTH ROCK.

Cock.—Bennett, 92½; Haycock & Kent, 91½, 2nd; Haycock & Kent, 90½, 3rd.
Hen.—Haycock & Kent, 93; H. Bender, 92½, 2nd; Bennett, 91, 3rd.
Cockerel.—Haycock & Kent, 93½; Bender, 92½, 2nd; Donnelly, 91½, 3rd.
Pullet.—Duff & Co., 92½; Donnelly, 92½, 2nd; Haycock & Kent, 92½, 3rd.

WHITE PLYMOUTH ROCK.

Cock.—Bender, 94½; H. H. Wallace, 92½, 2nd; Reid, 92¼, 3rd.
Hen.—Wallace, 97; Bender, 96½, 2nd; Bender, 95½, 3rd.
Cockerel.—Rice, Whitby, 96; Rice, 95½, 2nd; Bender, 94½, 3rd.
Pullet.—Rice, 97; Rice, 97, 2nd; Geo. Bogue, 96½, 3rd.

BLACK BREASTED RED GAME.

Cock.—Oldrieve & Nicol, 1st; Wm. McCloud, 2nd; Wm. Barber, 3rd.
Hen.—Barber, 1st; McCloud, 2nd; Oldrieve & Nicol, 3rd.
Cockerel.—Oldrieve & Nicol, 1st; W. J. James, 2nd; Wm. Main, 3rd.
Pullet.—Barber, 1st; James, 2nd; Main, 3rd.

DUCKWING GAMES.

Cock.—Barber, 1st and 2nd.
Hen.—Barber, 1st and 2nd; Oldrieve & Nicol, 3rd.
Cockerel.—Barber, 1st and 2nd.
Pullet.—Oldrieve & Nicol, 1st; Barber, 2nd and 3rd.

PYLE GAMES.

Cock.—Barber, 1st and 2nd; Oldrieve & Nicol, 3rd.
Hen.—Barber, 1st; Oldrieve & Nicol, 2nd; Barber, 3rd.
Cockerel.—Barber, 1st.
Pullet.—Barber, 1st and 2nd.

INDIAN GAMES.

Cock.—J. Axford, St. Thomas, 1st; Haycock & Kent, 2nd; C. H. Thornton, St. Thomas, 3rd.
Hen.—Thornton, 1st; Haycock & Kent, 2nd; T. J. Senior, 3rd.
Cockerel.—Thornton, 1st; Axford, 2nd; Senior, 3rd.
Pullet.—Daniels, 1st; Thornton, 2nd.

ANY OTHER STYLE OR VARIETY OF GAMES.

Cock.—Daniels, 1st and 2nd.
Hen.—Daniels, 1st and 2nd.
Cockerel.—Daniels.
Pullet.—Daniels.

Brown-Red Bantams.

Cock.—Barber, 1st; Charles Crowe, 2nd; McCloud, 3rd.
Hen.—Barber, 1st; McCloud, 2nd; Crowe, 3rd.
Cockerel.—Oldrieve & Nicol, 1st; Barber, 2nd; Crowe, 3rd.
Pullet.—Crowe, 1st; Barber, 2nd; Crowe, 3rd.

Black Red Bantams.

Cock.—Oldrieve & Nicol, 1st; Barber, 2nd; Daniels 3rd.
Hen.—Oldrieve & Nicol, 1st; Barber, 2nd; Daniels, 3rd.
Cockerel.—Oldrieve & Nicol, 1st; Barber, 2nd and 3rd.
Pullet.—Oldrieve & Nicol, 1st; Barber, 2nd and 3rd.

Duckwing Bantams.

Cock.—Barber, 1st; Oldrieve & Nicol, 2nd.
Hen.—Oldrieve & Nicol, 1st; Barber, 2nd.
Cockerel.—Barber, 1st; McCloud, 2nd; Oldrieve & Nicol, 3rd.
Pullet.—Barber, 1st and 2nd; McCloud, 3rd.

Pyle Bantams.

Cock.—Barber.
Hen.—Barber.
Cockerel.—Oldrieve & Nicol, 1st; Barber, 2nd; Oldrieve & Nicol, 3rd.
Pullet.—Oldrieve and Nicol, 1st; Barber, 2nd and 3rd.

Golden Seabright Bantams.

Cock.—Richard Oke, London, 94½; McNeil, 94½, 2nd.
Hen.—McNeil, 95; Oke, 94½, 2nd.
Cockerel.—McNeil, 94; Oldrieve & Nicol, 94, 2nd; Oke, 92½, 3rd.
Pullet.—McNeil, 95; E. B. Cale, Stratford, 2nd; Oke, 93, 3rd.

Silver Seabright Bantams.

Cock.—McNeil, 94½; Oke, 94, 2nd; Reid, 90½, 3rd.
Hen.—McNeil, 96½; Oke 95, 2nd.
Cockerel.—McNeil, 93; Oke, 92½; 2nd.
Pullet.—Oke, 95½; McNeil, 93½, 2nd.

W. R. Comb Bantams.

Cock.—Oke, 95; McNeil, 93½, 2nd; Cale, 92½, 3rd.
Hen.—Oke, 94½; McNeil, 93½; 2nd; Cale 93, 3rd.
Cockerel.—Oke 97; Cale, 94½, 2nd; McNeil, 93½, 3rd.
Pullet.—McNeil, 94½; Oke, 93½, 2nd; Cale, 93, 3rd.

Pekin Bantams.

Cock.—McNeil, 94; Daniels, 88, 2nd.
Hen.—McNeil, 93½; Daniels, 93, 2nd.
Cockerel.—McNeil, 93½; Benson, 92, 2nd; Pequegnat, 91½, 3rd.
Pullet.—McNeil, 94½; Daniels, 93½, 2nd; Oke, 93, 3rd.

Cochin Bantams.

Cock.—Daniels, 1st; H. B. Donovan, 2nd.
Hen.—Donovan, 1st; Daniels, 2nd.
Cockerel.—McNeil, 1st; Donovan 2nd and 3rd.
Pullet.—Donovan, 1st; Daniels 2nd; Donovan, 3rd.

White Booted Bantams.

Cock.—Oke, 94½.
Hen.—Oke, 95, Oke, 94, 2nd.
Cockerel.—Oke, 92½.
Pullet.—Oke, 94½.

JAPANESE BANTAMS.

Cock.—McNeil, 96; Daniels, 91½, 2nd.
Hen.—McNeil, 95½ Oke, 93½, 2nd; Daniels, 92½, 3rd.
Cockerel.—McNeil, 96; Oke, 94½, 2nd; Daniels 93, 3rd.
Pullet.—McNeil, 94½; Oke, 94½, 2nd.

POLISH BANTAMS.

Cock.—Oke, 91½.
Hen.—Donovan, 96½; Donovan, 95, 2nd.
Cockerel.—McNeil, 94½; Oke, 93½, 2nd.
Pullet.—Oke, 96½; McNeil, 95, 2nd.

LANGSHANS.

Cock.—Robert McCurdy, 94½; G. Bogue, 93½; J. M. Greyerbiehl, 93, 3rd.
Hen.—McCurdy, 95½; F. Goebel, 94½, 2nd; Goebel, 94, 3rd.
Cockerel.—Duff & Co., 94½; Goebel, 94½, 2nd; McCurdy, 94, 3rd.
Pullet.—Goebel, 97; Goebel, 96, 2nd; Goebel, 96, 3rd.

SILVER WYANDOTTES.

Cock.—J. H. Meyer, Kossuth, 93½; J. K. Kratzenmeier, New Hamburg, 91, 2nd; Meyer, 90, 3rd.
Hen.—Meyer, 92½ S. M. Clemo, Galt, 92½, 2nd; Meyer, 92, 3rd.
Cockerel.—Bogue, 94½; Meyer, 93, 2nd; Meyer, 93, 3rd.
Pullet.—Meyer, 95; Meyer, 94½, 2nd; Meyer, 93½, 3rd.

GOLDEN WYANDOTTES.

Cock.—Haycock & Kent, 92½; F. H. Scott, 92, 2nd; Scott, 89½, 3rd.
Hen.—Haycock & Kent, 92½; Haycock & Kent, 92½, 2nd; Haycock & Kent, 91, 3rd.
Cockerel.—Scott, 93½; Haycock & Kent, 93, 2nd; Haycock & Kent, 93, 3rd.
Pullet.—Haycock & Kent, 94; Scott, 94, 2nd; Haycock & Kent, 94, 3rd.

BLACK WYANDOTTES.

Cock.—Duff & Co.
Hen.—Duff & Co., Webber & Robertson, Guelph, 2nd and 3rd.
Pullet.—Duff & Co., 1st and 3rd.

WHITE WYANDOTTES.

Cock.—McCormick, 95½; McCormick, 92½, 2nd; Cale, 90, 3rd.
Hen.—McCormick, 95½.

LIST OF PRIZE WINNERS.—*Continued.*

WHITE WYANDOTTES.

Cock.—McCormick, 95½; McCormick, 92½, 2nd; Cale, 90, 3rd.
Hen.—McCormick, 95½; Haycock & Kent, 95, 2nd; McCormick, 94½, 3rd.
Cockerel.—McCormick, 96; Bogue, 95, 2nd; McCormick, 94, 3rd.
Pullet.—McCormick, 97; McCormick, 95½, 2nd; Bogue, 95½, 3rd.

SILVER CRESTED WHITE LEGHORNS.

Cock.—Rice, 95½; D. C. Trow, 94, 2nd; Plotsch, 94, 3rd.
Hen.—Rice, 97½; Rice, 97, 2nd; J. A. Laird, 95, 3rd.
Cockerel.—Rice, 96; I. Leyserson, 95½, 2nd; Plotsch, 94, 3rd.
Pullet.—Rice, 98; Rice, 97½, 2nd; Plotsch, 96½, 3rd.

SILVER CRESTED BROWN LEGHORNS.

Cock.—Rice, 95; Saunders, 91½, 2nd; E. Franke, 91, 3rd.
Hen.—Saunders, 95½; Rice, 94½, 2nd; Plotsch, 94, 3rd.
Cockerel.—Rice, 95; Rice, 94½, 2nd; Plotsch, 94, 3rd.
Pullet.—Plotsch, 95½; Rice, 95½, 2nd; Rice, 95½, 3rd.

SILVER CRESTED BLACK LEGHORNS.

Cock.—R. B. Puddicombe, Hamburg, 92½; Daniels, 92, 2nd; Schuler, 91, 3rd.
Hen.—Cleaver, 95; Schuler, 94, 2nd; Schuler, 93½, 3rd.
Cockerel.—Schuler, 94; Puddicombe, 94½, 2nd; Pepperdine & Chamberlain, 94, 3rd.
Pullet.—Daniels, 96; Schuler, 96, 2nd; Puddicombe, 95½, 3rd.

ROSE COMB BROWN LEGHORNS.

Cock.—Haycock & Kent, 94; Daniels, 91½, 2nd.
Hen.—Haycock & Kent, 94½; Daniels, 93½, 2nd; Haycock & Kent, 93½, 3rd.
Cockerel.—Brown, 95; Brown, 93½, 2nd; Haycock & Kent, 93, 3rd.
Pullet.—Haycock & Kent, 95½; Graysmith, 95, 2nd; Haycock & Kent, 94½, 3rd.

ROSE COMB WHITE LEGHORNS.

Cock.—W. J. Bell, Angus, 93½; Reid, 93½, 2nd.
Hen.—Bell, 96; Reid, 92, 2nd; Saunders, 94, 3rd.
Cockerel.—Bell, 96½; Saunders, 95½, 2nd; Daniels, 91½, 3rd.
Pullet.—Bell, 97; T. J. Keiley, 96, 2nd; Reid, 95½, 3rd.

ANDALUSIANS.

Cock.—W. H. Donstan, Bowmanville, 94½; W. R. Knight, 92½, 2nd.
Hen.—Knight, 95½; Donstan, 95, 2nd; Donstan, 94½, 3rd.
Cockerel.—Knight, 95½; Daniels, 93½, 2nd; C. Stockwell, 93½, 3rd.
Pullet.—Donstan, 93½; Knight, 93½, 2nd; Donstan, 93, 3rd.

GOLDEN SPANGLED HAMBURGS.

Cock.—McNeil, 93; Otis, 92, 2nd; Emrick, 91½, 3rd.
Hen.—McNeil, 94½; Emrick, 93½, 2nd.
Cockerel.—McNeil, 96; Otis, 93½, 2nd; Greenfield, 93, 3rd.
Pullet.—McNeil, 97; Otis, 95, 2nd; Bogue, 94½, 3rd.

SILVER SPANGLED HAMBURGS.

Cock.—McNeil, 95; Bruce, 93, 2nd.
Hen.—McNeil, 96; Otis, 95, 2nd; Bogue, 93½, 3rd.
Cockerel.—McNeil, 96½; Bogue, 94½, 2nd.
Pullet.—McNeil, 95.

GOLDEN PENCILLED HAMBURGS.

Cock.—McNeil, 94½; Otis, 94, 2nd; Bogue, 93½, 3rd.
Hen.—McNeil, 96½; Otis, 94½, 2nd; Bogue, 93, 3rd.
Cockerel.—McNeil, 96; Bogue, 94½, 2nd; Emerick, 93½, 3rd.
Pullet.—McNeil, 95½; Bogue, 95, 2nd; Emerick, 94½, 3rd.

LIST OF PRIZE WINNERS.—*Continued.*

SILVER PENCILLED HAMBURGS.

Cock.—Bogue, 93 ; McNeil, 93, 2nd.
Hen.—McNeil, 95½ ; Bogue, 92½, 2nd.
Cockerel.—McNeil, 96½ ; Oke, 93½, 2nd ; Bogue, 93, 3rd.
Pullet.—McNeil, 97 ; Bogue, 93, 2nd ; Oke, 93, 3rd.

BLACK HAMBURGS.

Cock.—Oke, 96½ ; McNeil, 96½, 2nd ; Emerick, 93, 3rd.
Hen.—Oke, 96½ ; McNeil, 95, 2nd ; Haycock & Kent, 94½, 3rd.
Cockerel.—McNeil, 96 ; McNeil, 96, 2nd ; Haycock & Kent, 95½, 3rd.
Pullet.—McNeil, 96½ ; Oke, 95, 2nd ; Munro, 95, 3rd.

SILVER GREY DORKINGS.

Cock.—Bogue, 92½.
Hen.—Bogue, 94½.
Cockerel.—Bogue, 94 ; Bogue, 95½, 2nd.
Pullet.—Bogue, 95 ; Bogue, 92, 2nd.

COLORED DORKINGS.

Cock.—Bogue, 93½.
Hen.—Bogue, 96 ; Bogue, 94½, 2nd.
Cockerel.—Bogue, 93½ ; Bogue, 92½, 2nd ; Reid, 92, 3rd.
Pullet.—Bogue, 95 ; Bogue, 94½, 2nd ; Reid, 93½, 3rd.

WHITE DORKINGS.

Hen.—Bogue, 96 ; Bogue, 94½, 2nd.
Cockerel.—Bogue, 94 ; Bogue, 93, 2nd.
Pullet.—Bogue, 95½ ; Bogue, 94, 2nd.

DOMINGOES.

Cock.—Bogue, 94 ; Knight, 88, 2nd.
Hen.—Haycock & Kent, 93½ ; Oke, 92½, 2nd ; Bogue, 89½, 3rd.
Cockerel.—Bogue, 94 ; Haycock & Kent, 90½, 2nd ; Haycock & Kent, 86, 3rd.
Pullet.—Haycock & Kent, 92 ; Bogue, 92, 2nd.

BLACK JAVAS.

Cock.—H. M. Henrich, 93 ; Daniels, 92½, 2nd ; McCormick, 92, 3rd.
Hen.—Daniels, 96½ ; McCormick, 95½, 2nd ; McCormick, 94½, 3rd.
Cockerel.—McCormick, 96½ ; Cale, 94½, 2nd ; McCormick, 94, 3rd.
Pullet.—McCormick, 96 ; McCormick, 96, 2nd ; Cale, 95½, 3rd.

WHITE JAVAS.

Cock.—Daniels.
Hen.—Daniels, 1st, 2nd.
Cockerel.—Daniels ; Wm. Coon, 2nd.
Pullet.—Daniels, 1st, 2nd.

SPANISH.

Cock.—Hare, 94½ ; Cale, 90½, 2nd.
Hen.—Hare, 94½ ; Emerick, 94½, 2nd ; Fraser, 93½, 3rd.
Cockerel.—Hare, 94 ; Emerick, 94, 2nd ; Hare, 94, 3rd.
Pullet.—Hare, 96 ; Fraser, 95, 2nd ; Hare, 94½, 3rd.

BLACK MINORCAS.

Cock.—Clemo, 90½.
Hen.—Senior, 95 ; C. W. Wood, 94, 2nd ; Munro, 94, 3rd.
Cockerel.—Rice, 96 ; Senior, 95½, 2nd ; Rice, 95½, 3rd.
Pullet.—Rice, 98 ; Rice, 96½, 2nd ; McCurdy, 95, 3rd.

WHITE MINORCAS.

Cockerel.—Daniels, 94 ; Senior, 92½, 2nd ; Senior, 91½, 3rd.
Pullet.—Daniels, 94½ ; Senior, 94½, 2nd ; Senior, 94, 3rd.

LIST OF PRIZE WINNERS.—Continued.

BRAHMAS.

Cock.—Trew, 95; Rogers, 94, 2nd; Trew, 92, 3rd.
Hen.—Trew, 96; Trew, 95½, 2nd; Knight, 95, 3rd.
Cockerel.—Shedwell, 94; Rogers, 94, 2nd; Trew, 93, 3rd.
Pullet.—Trew, 96½; Trew, 95½, 2nd; Trew, 94½, 3rd.

LIGHT CHINA.

Cock.—Oke, 95½.
Hen.—Oke, 94½; Oke, 91½, 2nd.
Cockerel.—Oke, 92.
Pullet.—Oke, 95½; Oke, 94, 2nd.

LANGSHANS.

Cock.—Oke, 97½.
Hen.—Oke, 95; McNeil, 94, 2nd.
Cockerel.—McNeil, 92½.
Pullet.—Oke, 96½.

WHITE CRESTED BLACK POLANDS.

Cock.—McNeil, 96; Rogers, 94, 2nd.
Hen.—Rogers, 97; McNeil, 96, 2nd.
Cockerel.—McNeil, 97; Rogers, 96, 2nd.
Pullet.—Rogers, 96; McNeil, 92, 2nd.

GOLDEN POLANDS.

Cock.—Rogers, 94; McNeil, 94, 2nd; Brown, 93, 3rd.
Hen.—McNeil, 94; Rogers, 93½, 2nd; Brown, 91, 3rd.
Cockerel.—McNeil, 94; Rogers, 94½, 2nd.
Pullet.—McNeil, 95.

SILVER POLANDS.

Cock.—Knight, 93; McNeil, 90½, 2nd; Rogers, 88½, 3rd.
Hen.—Rogers, 96; McNeil, 94½, 2nd; Knight, 93, 3rd.
Cockerel.—McNeil, 95; Rogers, 90½, 2nd.
Pullet.—Rogers, 95½; McNeil, 91, 2nd.

WHITE POLANDS.

Cock.—Rogers, 95; McNeil, 93½, 2nd; McMunn, Brantford, 92, 3rd.
Hen.—McNeil, 96½; Rogers, 95, 2nd; McMunn, 94, 3rd.
Cockerel.—McNeil, 94.
Pullet.—Rogers, 96; McNeil, 92, 2nd.

COLORED OR SILVER DORKINGS POLANDS.

Cock.—Rogers, 97½; McNeil, 93½, 2nd.
Hen.—McNeil, 96.
Cockerel.—McNeil, 94½; Rogers, 91, 2nd.
Pullet.—McNeil, 95½; Rogers, 95½, 2nd.

WHITE DORKINGS POLANDS.

Cock.—Rogers, 94½; McNeil, 94, 2nd; McMunn, 90, 3rd.
Hen.—Rogers, 96½; McNeil, 94, 2nd; McMunn, 93½, 3rd.
Cockerel.—Rogers, 90; McNeil, 93½, 2nd.
Pullet.—McNeil, 94.

BUFF LACED POLANDS.

Cock.—McNeil, 92; McNeil, 90, 2nd.
Hen.—McNeil, 96; McNeil, 95½, 2nd.
Cockerel.—McNeil, 91; McNeil, 90, 2nd.
Pullet.—McNeil, 97; McNeil, 95½.

LIST OF PRIZE WINNERS.—*Continued.*

RED CAPS.

Cock.—S. H. Rowlin, Hamilton, 94½; Daniels, 93, 2nd; Haycock & Kent, 91, 3rd.
Hen.—Daniels, 91½; Rowlin, 91½, 2nd; Haycock & Kent, 88, 3rd.
Cockerel.—Haycock & Kent, 94; Nevin, 94, 2nd; Haycock & Kent, 93½, 3rd.
Pullet.—Nevin, 94½; Rowlin, 94, 2nd; Haycock & Kent, 93½, 3rd.

ANY OTHER VARIETY FOWLS.

Cock.—Oke; Daniels, 2nd; Donovan, 3rd.
Hen.—Daniels; Donovan, 2nd; Daniels, 3rd.
Cockerel.—Daniels.
Pullet.—Daniels.

COMMON BRED, 1893.

Cockerel.—Thornton; Webber & Robertson, 2nd; Bogue, 3rd
Pullet.—Pletsch; Webber & Robertson, 2nd; Thornton, 3rd.

BRONZE TURKEYS.

Cock.—Bell; Main, 2nd; Somerville, 3rd.
Hen.—Bell; Main, 2nd; Somerville, 3rd.
Cockerel (1893).—Bell; Main, 2nd; Somerville, 3rd.
Pullet.—Bell; Main, 2nd; Somerville, 3rd.

TOULOUSE GEESE.

Gander.—Bogue; Pletsch, 2nd.
Goose.—Pletsch.
Gander (1893).—Bogue, 1st, 2nd.
Goose (1893).—Bogue, 1st, 2nd.

BREMEN GEESE.

Gander.—Main.
Goose.—Main.
Gander (1893).—Main.
Goose (1893).—Main.

AYLESBURY DUCKS.

Drake.—Bogue, 98½; Bogue, 96½, 2nd; McKee, 95, 3rd.
Duck.—Bogue, 98; Bogue, 97½, 2nd; McKee, 95, 3rd.
Drake (1893).—Bogue, 97½; McKee, 97, 2nd; Bogue, 96, 3rd.
Duck (1893).—Bogue, 98½; Bogue, 98, 2nd; Wallace, 96½, 3rd.

ROUEN DUCKS.

Drake.—Main, 96½; Knight, 96, 2nd.
Duck.—Main, 98½; Main, 96½, 2nd; Knight, 95, 3rd.
Drake (1893).—Bogue, 98; Main, 96, 2nd; Knight, 96, 3rd.
Duck (1893).—Main, 98; Bogue, 98, 2nd; Knight, 96½, 3rd.

PEKIN DUCKS.

Drake.—Bogue, 98½; Bogue, 98½, 2nd; Colson, 98, 3rd.
Duck.—Bogue, 99; Bogue, 98, 2nd; Colson, 97½, 3rd.
Drake (1893).—Bogue, 99; Duff & Co., 98½, 2nd; Webber & Robertson, 98, 3rd.
Duck (1893).—Bogue, 98½; Hamilton, 98, 2nd; Duff & Co., 97½, 3rd.

ENGLISH PHEASANTS.

Niven, 1st.

GOLDEN PHEASANTS.

Niven, 1st, 2nd.

SILVER PHEASANTS.

Niven, 1st, 2nd.

ANNUAL REPORT

OF THE

EASTERN ONTARIO POULTRY AND PET STOCK ASSOCIATION.

To the Honorable the Minister of Agriculture:

SIR,—I have the honor of forwarding to you a financial statement and a report of the Eastern Ontario Poultry and Pet Stock Association for the year 1893.

Since the Association was formed in the year 1884 a steady increase has taken place in the advancement of poultry culture in this part of the country; and one cannot but be struck with the great difference between the large thoroughbred and half-bred poultry offered for sale on our markets of to day and the little mongrel or barn yard fowls of a few years ago. This is largely due to our Association and the opportunities afforded for buying stock at our annual exhibitions.

The Association held meetings on the first Monday in each month, with the exception of June, July and August. At these meetings the general business of the Association was transacted, and many matters connected with poultry culture were discussed.

In view of advancing the usefulness of the Association it was decided to obtain a hall in which to hold our monthly meetings, during next year, the present place of meeting being too small, and by the delivering of lectures, reading of essays, etc., the membership of the Association might be largely increased. It was also thought advisable to offer substantial prizes next year for dressed poultry.

The Tenth Annual Exhibition was held in the By Ward Market Hall, Ottawa, on the 6th, 7th, 8th and 9th February, 1894, and was the most successful in the history of the society, both as to the number of entries and the quality of the stock exhibited.

The large breeds, such as Brahmas, Cochins and Langshans, showed a great increase over last year; and the business breeds, such as Plymouth Rocks, Wyandottes and Leghorns, were a large entry. Turkeys, Geese and Ducks also showed an increased entry over last year; and a pair of Wild Turkeys exhibited by U. Bonneville, of Danville, attracted much attention.

In Pigeons the entry was not nearly as large as last year, owing to the fact that none of the large outside fanciers made any entries; the local exhibits, however, were larger and better than last year.

The poultry were judged by Mr. J. Y. Bicknell, of Buffalo, N. Y., and all birds not disqualified were scored. The pigeons and pet stock were judged by Mr. James Ainslie, of Montreal, P. Q., and both gave general satisfaction.

The entries numbered 717, of which 228 were local and the remainder, 489, were from Owen Sound, Port Hope, Norwood, Bowmanville, Kingston, Brockville, Toronto, Almonte, Montreal, Danville, etc.

During the show many sales were made, and I am glad to be able to say that a large number of male birds were disposed of to farmers and others for the improvement of their stock.

Prizes were paid on the last day of the show, and all exhibitors went home apparently well satisfied.

I have the honor to be, Sir,

Your obedient servant,

ALFRED GEDDES,

Secretary.

FINANCIAL STATEMENT.

Ed. Connell, Treasurer, in account with the Eastern Ontario Poultry and Pet Stock Association for the year ending December 31, 1893 :

Receipts.	$ c.	Disbursements.	$ c.
Cash from previous year	49 76	Cash paid for prizes	353 50
Members' fees	52 00	Officers' salaries	50 00
Donations	22 00	Postage and stationery	18 53
Legislative grant	400 00	Printing and advertising	68 15
Receipts at exhibition	32 90	Judges' expenses	81 35
Advertisement in prize list	5 00	Coops, storage and cartage	74 50
Entry fees	165 00	Heat, light and insurance	21 90
		Wages, caretaker, etc	29 00
		Feed	12 76
		Sundries	3 85
		Balance on hand	13 12
Total	$726 66	Total	$726 66

Examined and found correct.

E. H. Benjamin, B. S. Auclair, } Auditors.

March 22, 1894.

LIST OF OFFICERS.

Honorary President, O. A. Rocque, Orleans ; *President*, Alex. Stewart, Hintonburg ; *1st Vice-President*, G. S. Oldrieve, Kingston ; *2nd Vice-President*, George Higman, Ottawa ; *Secretary*, Alfred Geddes, Ottawa ; *Treasurer*, E. A. Connell, Ottawa.

Directors : E. H. Benjamin, Evan Edwards, John Mason, S. Short, John I. Gill, Thos. Murphy, C. J. Devlin, Wm. Gray and James Jacques, of Ottawa.

Auditors : E. Daubney and S. Short, of Ottawa.

APPENDIX.

DESCRIPTION OF SOME VARIETIES

By L. G. Jarvis, London, Ont.

Light Brahmas.

The general characteristics of the Brahma are quite distinct from other fowls, so that a short general description will first of all be necessary. A light Brahma male ought not to weigh less than ten to twelve pounds. The head of the male should be white, the hackle, or neck plumage silvery white, with a distinct black stripe down the centre of each feather. The shoulder coverts, back, breast, thighs and under parts are white on surface; under color may be a bluish white, but pure white is preferred. The secondaries or outside wing feathers are white on the outer web, and black on the inner web, the primaries or flights, or inside wing feathers, are black or nearly so. The saddle feathers, white; the tail coverts or the soft glossy feathers at the sides of the lower part of the tail, glossy green black, being silvered on the edges. The tail should be a rich glossy green black, feathers finely edged or banded with silvery white, in shape full and well spread, carried tolerably upright. Legs and toes—thighs stout and well covered with soft feathers, color, white; shanks or legs of medium length, stout in bone, a bright or reddish yellow color, well feathered on the outside of leg, the feathers white more or less mottled with black; comb pea, small, firm and even on the head, and distinctly divided, having the appearance of three small, single combs joined together at the base and rear, the largest and highest in the middle, each part evenly serrated. The hen should have a pure white head, comb in shape the same as the male but smaller. The neck-hackle should be white and broadly striped down each feather with black, ending clear and sharp at the base. All the body color should be a clear white surface; under color may be a bluish white but clear white preferred. The primary feathers in the wing, black and white—black to predominate. The tail black edged with white; the shanks like the male. The merits of these fowls are very great when of the size we have spoken of; and we maintain that the quality of the meat is also good. A young Brahma is at least better eating than the majority of the poultry now sold on our markets, and a well fed young male bird of eight or ten pounds weight at six or eight months, dressed and served as a turkey will be found little inferior either in appearance or flavor. An old fowl will not compare with the Dorking or Rock. It is true the production of eggs is not as large as from some of the smaller varieties, being interfered with by the propensity to sit, yet there are strains of this breed that produce from ten to twelve dozen eggs per annum. They are considered good winter layers—above the average. Perhaps there are no other fowls excepting the Rocks, Wyandottes, and Javas, that will suit so many varying requirements; but I may say they are not adapted for all circumstances. For a market fowl the Brahma crossed with the Dorking, will mature earlier and can hardly be distinguished from the pure bred Dorking, a breed so highly prized as a table fowl.

Dark Brahmas.

The head and neck of a dark Brahma male are very much like the light. The hackle is striped with black. The back is nearly white, a little black appearing here and there between the shoulders, the black should predominate, but is nearly hidden by the hackle flowing over it. The saddle feathers are like the hackle, silvery white striped with black. The tail is in shape the same as in the light; in color, solid black with a green

gloss, any white being a great defect. The wing coverts are black, forming a distinct bar across the middle of the wing, the ends of the secondaries, or the feathers which appear when the wing is closed, have a large black spot on the ends; the remainder of the secondaries are white on the lower half and black on the upper—the black not visible. The breast in mature birds should be black. The shank feathers the same, the color of shanks yellow, comb the same as the light.

The female—Back, plumage grey, with distinct dark pencillings, the feathers free from white shafting, breast in color same as back; shoulders and wing coverts in color same as breast, body and tail coverts; thighs stout and well covered with soft feathers, the same color as the body, pencilling desirable; shanks or legs yellow, well feathered on outside, same color as the thighs. The middle toe should be well feathered. The size and economic merits of the dark Brahma are about the same as the light, but it has not as many admirers.

Dorkings.

There are three varieties of this valuable breed of fowls—silver grey, colored and white. No more beautiful bird than the white Dorking can be well imagined upon the country lawn. In symmetry the white surpasses all others of the Dorking breed, having much of the grace and grand sweeping outlines of the Hamburg. The elegance of their carriage, the gloss and purity of their beautiful white plumage is much admired by fanciers of the feathered tribe. With regard to size they are not quite as heavy as the other varieties of Dorkings. A male, when fully matured, should weigh from seven to eight pounds, and like the silver grey and colored "makes its weight early"—a very great advantage. Like the Rock fowl it has a natural aptitude for getting and keeping fat. As a table fowl they have no equal. As sitters the Dorkings are considered the best perhaps of all fowls. They lay a fair sized, beautiful white egg, but will not lay as many as several of the other breeds. The white variety have fine rose combs, legs pure white and five toes on each foot, the fourth and fifth should be well spread and starting out from the leg, the fifth turning slightly upwards.

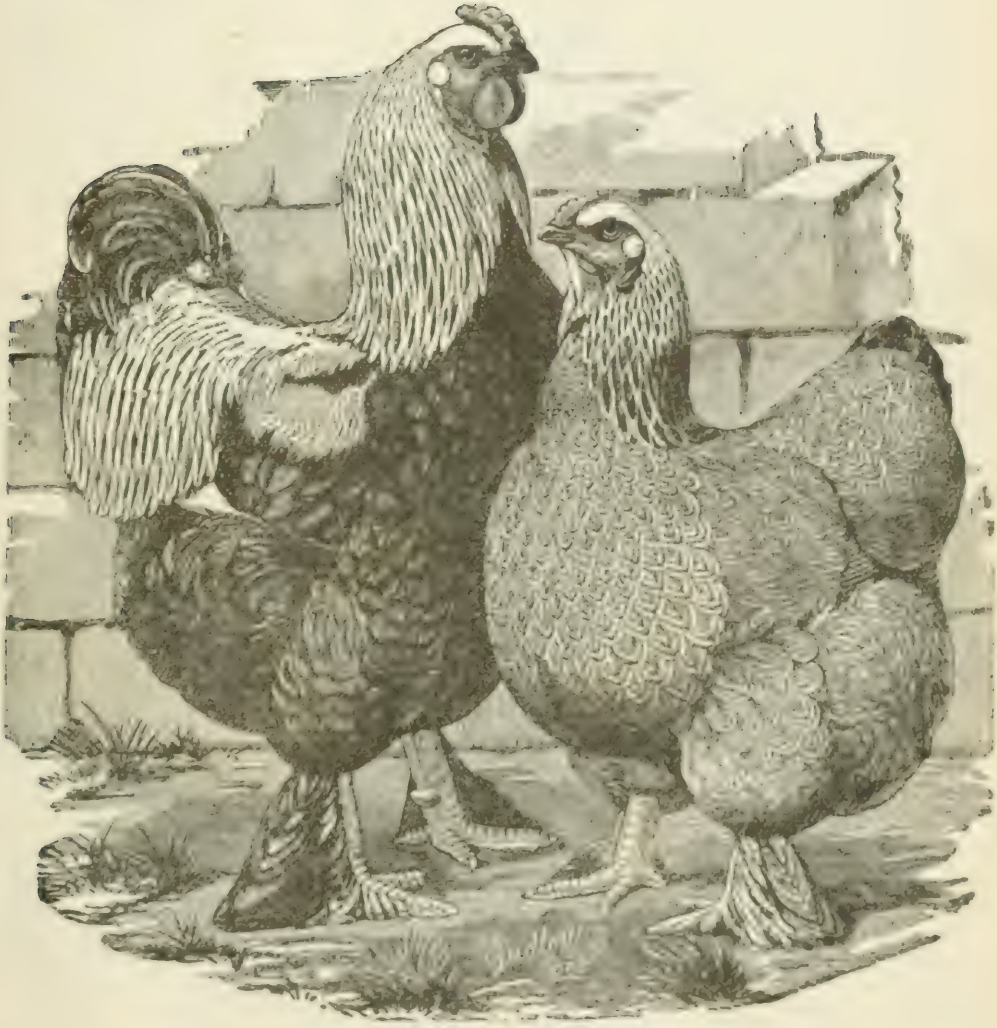
The chief points of the silver greys are as follows: The male should have a pure silvery-white neck-hackle, back, saddle and upper wing coverts; the black under feathering of the back being entirely covered by the silvery white feathers of the neck, and the wing entirely free from chestnut patches, the tail, thighs and breast perfectly black, legs white, and like all Dorkings have five toes on each foot; comb, single, large and straight free from any twist. The hen when near perfection, is of very great beauty. The light grey ground color is closely covered over by a minute pencilling of darker grey, which gives that peculiar silvery appearance so attractive. Every feather on the sides and back should show the white shaft distinctly. They should be salmon or robin breasted and without any ruddiness on the wings. Legs same as in the male.

Colored Dorkings.

The chief points in the colored Dorkings are: Males, comb single, straight, evenly serrated and free from any side sprigs; neck with abundant hackle flowing over the shoulders, white with a black stripe down the centre of each feather; back, in plumage white and black; saddle feathers same as neck hackle; breast, rich glossy black, also the body; tail large, in color black, any white appearing a great objection; legs white. The hen's breast is salmon-red, each feather tipped with black, the wing feathers black around the edges with a rich brown centre, pencilled or shaded with black, and the back and saddle almost black; all the feathers showing the white shafting excepting on breast. Legs same as male.

Leghorns.

This useful and beautiful breed of fowls has now become exceedingly popular, and has more admirers than any other breed of poultry. There are several varieties of the Leghorn family. The brown and white as yet are preferred. They are non-setters, and unless incubators and brooders are used it will be necessary to obtain other hens to



DARK BRAHMAS.

hatch and rear the broods. They are extraordinarily hardy and mature early, so that the pullets commence to lay quite early in the fall If egg production alone is the chief point to be desired, we consider the Leghorns will prove satisfactory, as there can be no question as to their excellence in this respect. In these two varieties we have the single and the rose comb, the former being more admired for the simple reason, probably, that they are more stylish, as no difference can be discerned in their laying qualities. We will give a few of the leading points of the single comb brown Leghorn, as the rose comb variety differs from it only in the shape of the comb. The male should have a large straight comb, evenly serrated, five serrations being preferred in the show pen ; ear lobe an opaque white, in shape, pendant or almond shaped ; neck hackle, golden bay with distinct stripe down each feather ; the saddle the same as neck in color ; breast black, round and carried well forward ; tail, black ; legs, yellow. Hen : Head dark brown, the feathers slightly striped with black, comb single and falling over to one side of the face, evenly serrated, and in points same as male ; neck, yellowish brown ; feathers striped with black ; ear lobes, same as the male ; back, brown pencilled with black ; breast, a salmon brown ; legs, yellow. Whites differ only in color, being a pure white, free from any yellow tinge or straw color.

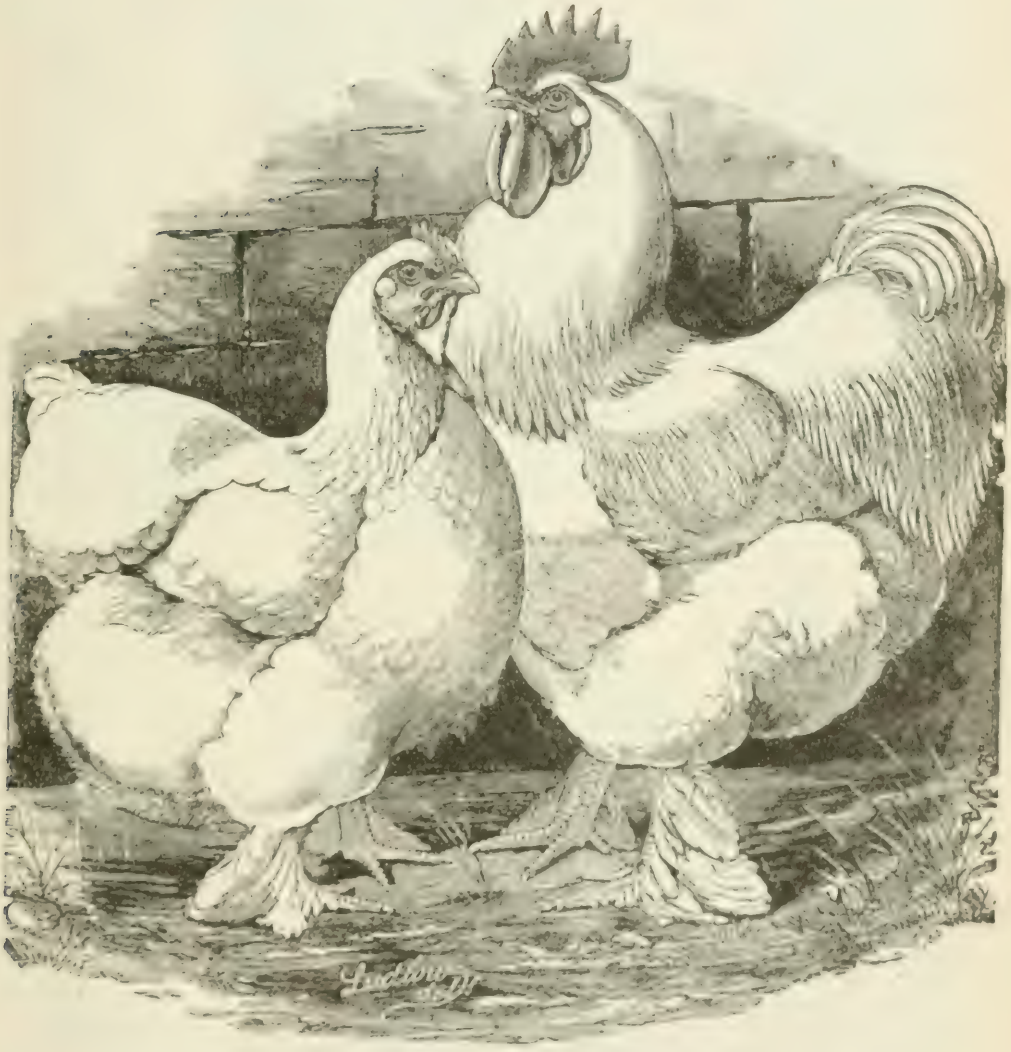
White-Faced Black Spanish.

No doubt the weakest point in the Spanish is their delicacy and slow growth when young. They are considered fair layers. Their eggs are larger than any other breed of fowl. In symmetry and unique beauty these birds are not easily excelled. One of the greatest merits that a Spanish fowl can have is a spotless white face and ear lobe, and freedom from wrinkles. Perhaps no point in any breed of poultry could better show what may be effected by long and careful breeding than the face of the Spanish. The face should be free from coarseness, for in very lumpy faced birds, the white, as they grow older will close up the eye so as to prevent the bird from seeing. The comb in the male should be bright red, single, firm and well set on the head, thick at the base, perfectly erect, straight and evenly serrated. The neck should be a little longer than medium, gracefully curved ; the body deep and narrow, back rather slanting ; legs of a dark leaden hue ; tail, full and standing rather perpendicularly.

The female should be like the male in face and legs, the comb large and drooping over to one side of the face. The Spanish are classed with the non-setting breeds, and no doubt are the oldest variety of them. The chicks, like the Asiatics, are quite naked for several weeks, but unlike them are not considered hardy.

Plymouth Rock.

This noble breed of fowl has come to stay, and stands at the head of all others as a general purpose fowl. They are good layers, good mothers and splendid table fowl. They mature early, and their skin being yellow makes them a desirable breed to raise for the market. In size they come next to the Aisatic classes. They are of a quiet disposition yet they are great foragers ; when fully matured with ordinary care they will always be found in good condition—in fact Rocks that are required for laying purposes only should not be fed heavily, as they are apt to get too fat, and a fat hen is never a good layer. There are three varieties, barred, white and buff. The former is preferred, on account of its rich and beautiful color, although the whites have a great many admirers. The elegance of their carriage and their snow-white plumage make them an ornamental bird, as well as the barred variety, where a grass run can be procured. In symmetry and shape as well as in size, they are identical. A mature male should weigh from eight to ten pounds. The barred variety in color is black and white, the white being a bluish color, every feather being evenly barred across with black. Legs, a rich yellow color. Too much cannot be said in favor of this useful breed of fowls for the farmer, and in cities or towns where only one breed can be kept, and in close confinement, they will thrive and do well and give general satisfaction.



WHITE COCHINS.

Games.

The Games find many admirers, and for broilers or roasters, or as mothers of chicks, they may be said to equal the Dorking. The Games cannot be said to be extra layers, but may produce from 125 to 150 eggs in a year if they have sufficient range. That some change has taken place in the general style of Game birds of recent years cannot be questioned, and as regards appearance the change is certainly for the better, and nothing has been lost in other points. The improvement in all breeds during the past few years has been shared by the Game fowl in a more marked degree, and at all of the leading poultry exhibitions, we find fine specimens in each class of the Game varieties, of which there are many. Fabulous prices are being paid by fanciers of this old variety of fowl. We may make special mention of the Indian Game, a variety that has been lately imported from England to this country, and has had a great boom of late years in Canada and the United States. They are larger than any other variety of Game, excepting the Malays, a variety they much resemble. They are no doubt a good table fowl. They have rich yellow skin, are very compact, and are rich in plumage. They are very docile and are considered fully as good egg producers as any of the other varieties. They make a good general purpose fowl, and on some of the large poultry farms in the States, are used exclusively. They can now be procured at reasonable prices in this country.

Cochins.

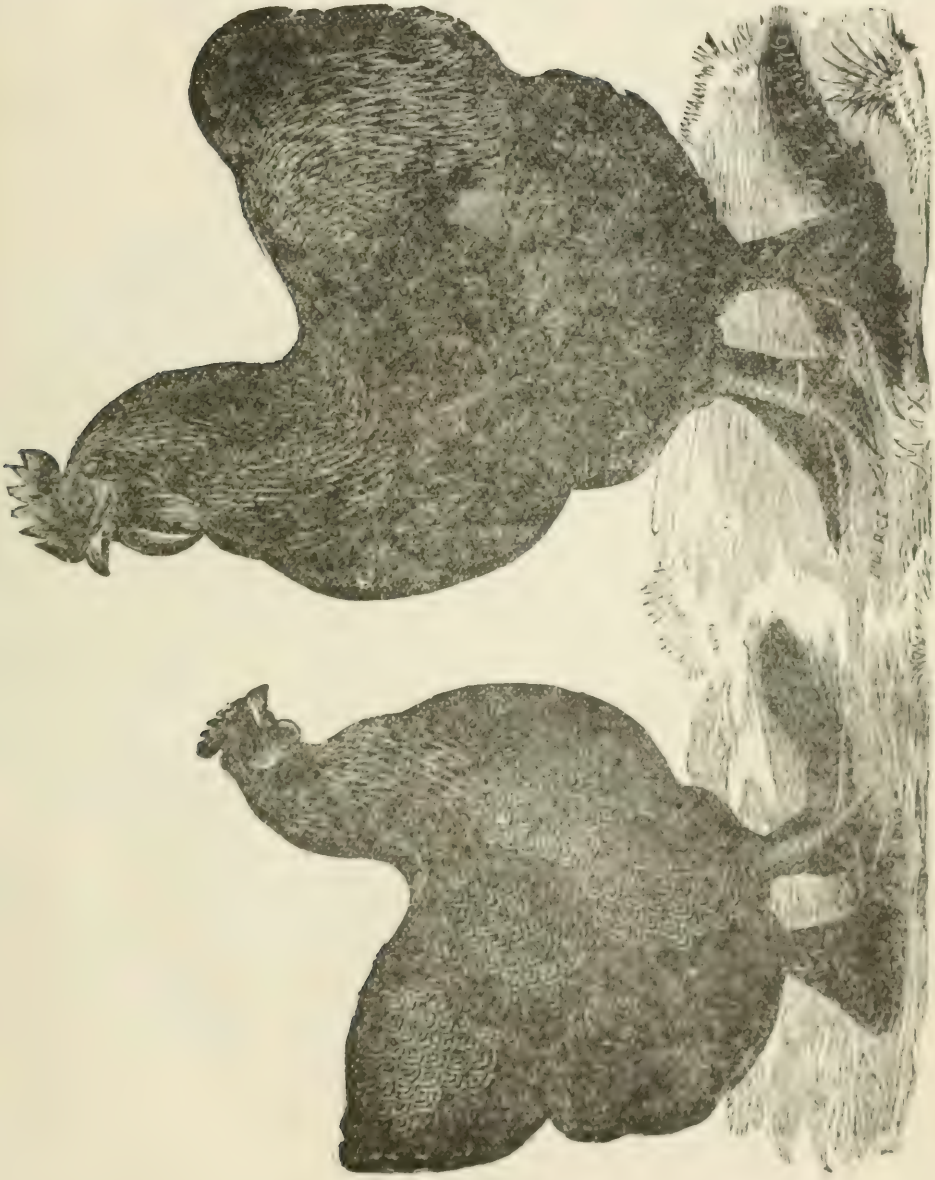
The Cochins, as we stand before them in their pen, merit at our hands some tribute of respect. There are four varieties, the buff, the black, the white and the partridge; each have their special admirers. They are the largest of any breed of fowls—a good specimen looks larger even than his actual weight, as the plumage is very loose and fluffy, owing to the feathers being broader across the web, and thinner in the shaft or quill, than that of other varieties. They are sought after more by the wealthy classes and bred for fancy rather than usefulness, as they are not good layers, neither are they a good table fowl. Good specimens bring long prices, and no breed is more admired at our shows than the Cochins. Nothing could be more beautiful than a flock of white Cochins; the elegance of their carriage, the gloss and purity of their plumage, reminding one of pure white satin, seems at once to say, "I belong to the upper class." Of all ornamental fowl they are the largest.

Houdans.

Of all the French breeds of fowl the Houdan may be considered the best. The French breeds have all one point in common—every one of them is very delicious eating. The Houdan fowl in plumage is black and white, and should be free from any brassiness. The crest and beard are of the same color. The comb is like the letter "V" in shape, and of small size; legs, stout and of a lead color, and slightly mottled. They have five toes on each foot, the same as the Dorking. They should be evenly mottled in plumage—the black predominating. The weight of adults is from seven to eight pounds each. Further experience of the Houdans has proved them to be hardy, and when properly selected, excellent layers. They are very hardy as chickens, and feather and mature in a much shorter time than the majority of breeds. They are non-setters and it is very rare for them to show any tendency to incubate. It is worthy of note that though good foragers, they are easily kept in bounds. They lay large white eggs, and the chickens are fit for the table at four months old. As a farmer's fowl we can strongly recommend them.

Andalusians.

The variety known by this name is another that can be highly recommended for its laying qualities, and is also a good table fowl. The male should weigh from six to eight pounds, and the hen five to six. Their eggs are considered of fine flavor, and are nearly as large as the Spanish. Their comb in shape is similar to that of the Spanish. The



PARTRIDGE COCHINS.

face is red; ear-lobes pure white and showing up very distinctly from the face, very much as in the Minorcas. The general plumage is a bluish shade or a slate color, laced round the edges with black. The plumage of both sexes is alike, except the hackle and upper feathers of the male which are much darker. As a useful fowl this variety is well worthy of attention. They should be carefully mated, however, as, like the Wyandottes, they have a tendency to pass into a mongrel-like appearance as regards color. In the best specimens of Andalusians the color is something worth boasting over.

Minorcas.

This breed is quite popular in England but until lately has rarely been shown, at any of our poultry exhibitions in America, being seldom found in the hands of fanciers. Of late years, however, the merits of these fowls have brought them much more into notice, and all of the important shows give them special classes, usually well filled with grand specimens of both varieties, the black and white, and they have made a place for themselves among the egg producing varieties. They possess all of the useful qualities of the Spanish, a breed they much resemble, excepting in color of face. They are larger, plumper in make and much better layers, and more hardy. We can strongly recommend this breed considering the size of their eggs, as good egg producers and they will stand confinement. The two varieties only differ in color; the black seems to be the favorite and should be of a rich metallic black in color; comb large single and deeply serrated; ear-lobes white, and larger than the Leghorns.

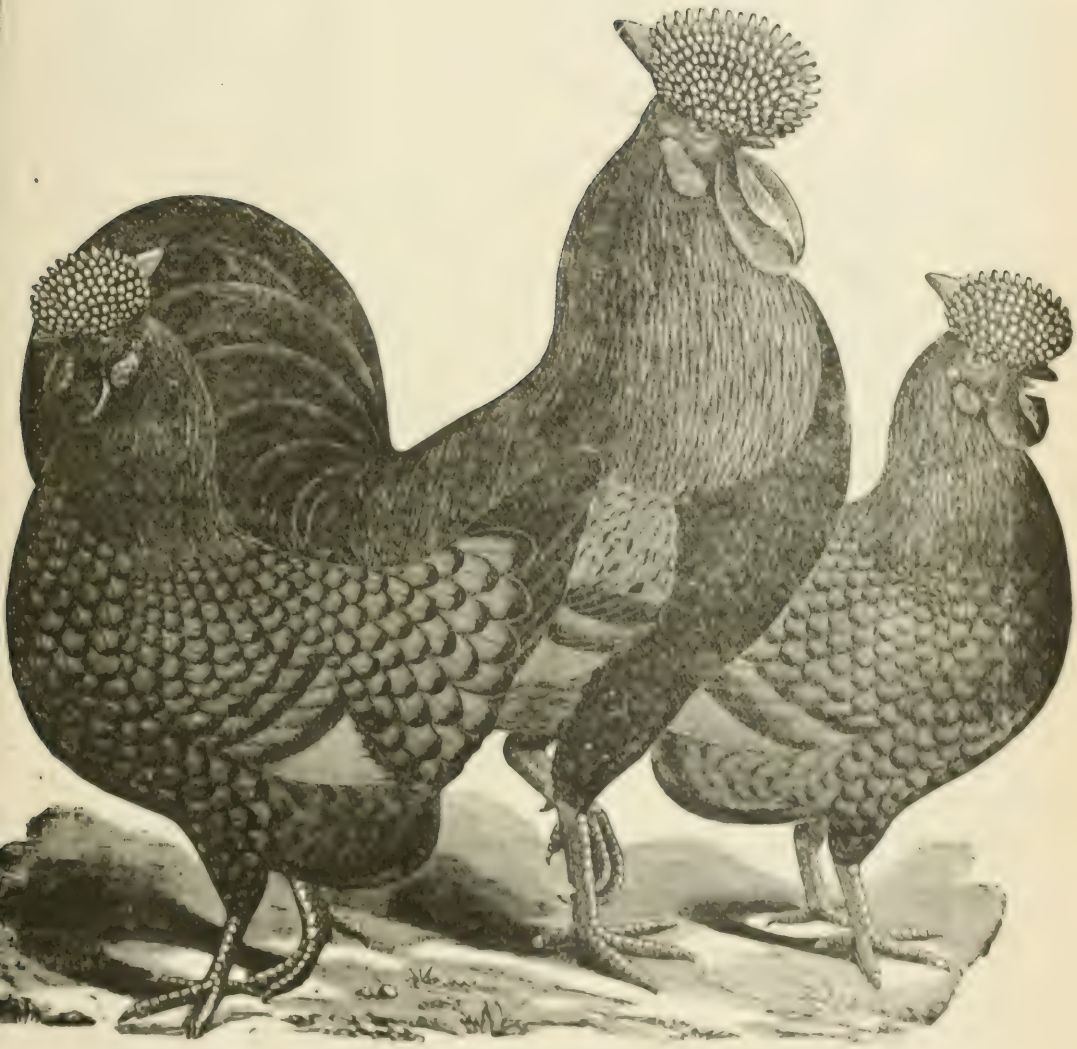
Wyandottes.

This name has been given to the more recent of the new American breeds. The stock has spread rapidly throughout this country. That our neighbors across the line have produced so many breeds which have stood the test of time is somewhat remarkable. There are several varieties of the Wyandotte, silver and golden laced, white, buff, and black. The former two are the most called for and are the hardest to breed true to color. The plumage of the silver is black and white, feathers being laced with black, comb rose rather small, fitting closely to the head, covered with small points, the entire comb conforming to the shape of the skull. The color of the back of the male should be silvery white; saddle silvery white, each feather striped with black; the same color for neck hackle; legs yellow and quite short. The plumage of the golden variety is black and golden bay or reddish bay, laced with black the same as the silver; the symmetry and size of all the varieties are the same and need no further description. The Wyandottes are no doubt the best winter layers, of any of the American breeds. They are also a good market fowl, being plump and, like all others of the American varieties, have a rich yellow skin so much desired in the Canadian market. We bespeak for them a very successful career. "May their shadow never grow less."

DERBYSHIRE RED CAPS.

By F. H. Brown, Port Hope.

The Derbyshire Red Caps are natives of Derbyshire, England, and are especially noted for their great egg producing qualities, as they are claimed to excel the Leghorns and all other non-setting varieties in the production of eggs. In fact, they are regular egg machines in themselves, and are decidedly the fowl for the raisers of eggs for market. The eggs are above the average size, and are of a superior quality and flavor. The color of egg is white or slightly tinted. The birds possess a plumage that will stand exposure to dirt, dust and weather and still look well the year round. The distinguishing feature of the Red Caps as suggested is the rose comb, which should be of good medium size, full



RED CAPS

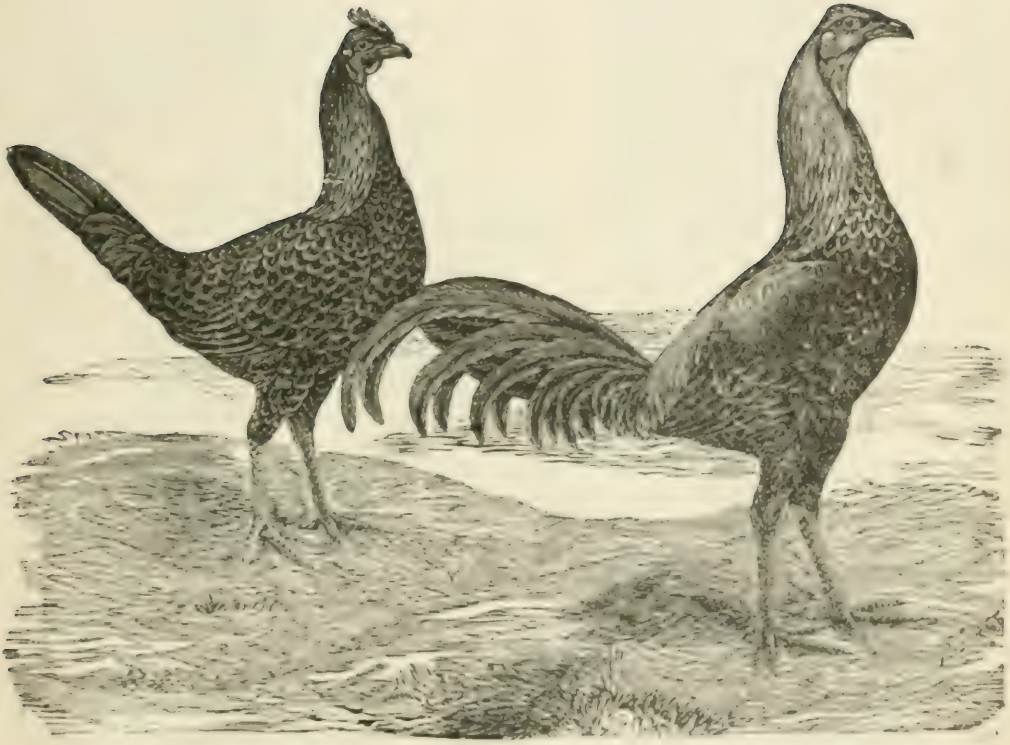
of fancy work or spikes standing perfectly straight on the head, with long, straight spike behind. Of course the comb of the cock should be much larger than that of the hen. The neck hackle of the cock should be a rich dark red, or golden red, striped with bluish black; the back should be black and red; breast and tail solid black; saddle rich deep red striped with bluish black; wings, nut brown; wing coverts, bluish black; legs, slate color and of a good length; ear-lobes and face, rich red. The standard weight of a cock is seven and a half pounds. The ground color of a hen is a rich, nut brown, each feather spangled with a bluish black half moon or crescent shaped spangle; tail, black; ear-lobes and face, red; neck hackle, laced with red; standard weight of hen six and half pounds. A Red Cap cockerel at six months will weigh six pounds and a pullet of same age will go five pounds. The Red Caps are a fair table fowl, much better then the Leghorns or Minorcas, being of a nice rich, juicy meat. The size and weight place them in the front rank as a general purpose fowl; they are a happy and contented family and good foragers. They bear confinement well, and the chicks are very easily raised and mature rapidly; at first sight their creed catches the eye of the majority. They are troubled less with the different diseases than most any other breed of poultry, and stand cold weather well, owing to the large amount of blood constantly in circulation through the comb which gives them a great advantage over a single comb fowl. The Red Caps are finding great favor in America, and the demand for them is constantly increasing as their valueable qualities become more generally known, and records point to the fact that there are as good Red Caps in Canada at the present as to be had in America. Persons desiring this beautifully feathered fowl, with its proud and erect carriage can find advertisements of the different breeders in the poultry journals. We have heard of a Red Cap breeder in Canada who had a Red Cap cockerel and four pullets, and in the months of February, March, April and May, (a total of one hundred and twenty days) he received 373 eggs, being over three eggs every day from the four pullets. This record beats anything we have heard of from any other variety of fowls. As grain is at such a low price we feel satisfied that if our farmers would take up a flock of good poultry, such as the Red Caps, and feed their grain or at least a portion of it, they would make a great profit in this way. Farmers and others feed stock to perfection, and take great care of it. Why not do the same with your poultry, in which there is more money than in horses or cattle or any other farm production?

POULTRY ON THE FARM.

By Mr. L. G. Jarvis, London, Ont.

Selection of Stock. Farmers fail to keep poultry profitably, because their stock is not adapted to their circumstances, or to the purpose intended. A great many breeds have been developed by the poultry fancier, differing in quality and appearance, and suited to special requirements. If the desired feature be in the shape of egg production, larger size of body, early maturity for the market, or anything else, there is at least some one of those breeds adopted for the purpose desired.

If only one breed is to be kept, and both eggs and meat are required, I would select the Plymouth Rock, either the barred or white. For market purposes and for the farmer and breeder who keeps fowls to supply consumption of eggs and poultry, the Plymouth Rock has no equal. If constant laying is required, select the Leghorns, Wyandottes, Minorcas, or Houdans. The former will produce the most eggs and of fair size and good quality, while the Wyandottes will lay more during the winter and will be found a good table fowl of good size. They mature early, making them a good market fowl. Minorcas will furnish the largest eggs, but they are not quite as hardy as the others, and having white skin is somewhat against them for the Canadian market. The Houdan is the only French fowl suitable to this climate, and is considered a good all round fowl of large size, an average layer, eggs a good size—next to the Minorcas or Spanish; they are becoming more popular and no doubt will be one of the leading breeds for the farmer.



GAME FOWLS.

Where dead poultry for the market is the main object the Dorking and Brahma are invaluable. They fatten easily and mature early, and have a fine appearance on the table. They may be crossed, when they will produce the largest fowls of any cross-breeds known, and can hardly be distinguished from the pure Dorking, so much admired in England as a table fowl.

We have mentioned the varieties which as a rule will produce the best results, in the various circumstances referred to, and with proper care will prove profitable to the farmer, and add greatly to the requirements of the people. After selecting your stock you must proceed to study and care for them if you expect to have satisfactory results; for if left to breed indiscriminately, and only get what food they can pick up and without suitable accommodation, the result will not be satisfactory.

As regards laying stock, nearly all fowls, under ordinary circumstances will lay so long as eggs are cheap; but to produce eggs in winter means profit and the want of them as clearly means loss. Pullets hatched early, will moult early and have the advantage of the warm weather, and so get through the process much quicker. They are then ready to commence laying in good time. No hen should be allowed to see more than her third autumn; after that age there is a great falling off in the egg production. We find that stock produced from two year old birds will grow larger and mature earlier than from young stock. If pullets are to be bred from they should be mated with mature males not having over ten to fifteen hens to each male.

Feeding and General Treatment of Fowls. Proper feeding, proper accommodation, pure air, cleanliness and exercise are the essentials to successful poultry-keeping, and when the amateur becomes interested in the care of his stock and sees them healthy and attractive in appearance, and the readiness to which they respond to good treatment by the merry cackle, the work that they once considered laborious becomes now pleasant and remunerative. No fowls require at the most more than three meals per day; the morning meal is the most important and the best relished, it should consist of soft or pulpy food of some kind, and be fed as early in the morning as possible. As for quantity no fixed scale can be given, but no more than they can eat up clean.

Ground oats will make the cheapest and best soft food; to this may be added barley meal and boiled potatoes, well mashed. If skim-milk can be procured it should be used for mixing instead of water, especially with laying hens. The mixing of this food is important. It should be mixed as dry as possible, for if too wet and sloppy it may produce diarrhœa. It should be so mixed that while none of the meal be left dry, the whole should be so firm and short that a mass of it will break and crumble if thrown on the ground. Food so mixed is more wholesome and will be better enjoyed.

With regard to grain, use wheat, barley or buckwheat for a midday meal, and corn at night. When fowls are confined they need exercise, and to secure it the floor or shed should be covered with cut straw or leaves on which all grain should be scattered so that the fowls will have to scratch for every kernel they get. It is a "do or die" policy, but it works admirably, I find that buckwheat is the cheapest and best of all grain for laying hens. Fowls become fond of it as soon as they get to recognize its strange color; by cooking it until it cracks open like rice you will find it will be eagerly sought after, and can be given once a day with good results. In France, where they produce such immense quantities of eggs for the English markets, they use this grain almost exclusively, both for fattening and for egg production. To keep fowls in health and good condition they do not require animal food but if a regular supply of eggs be desired it is quite necessary. A bullock's liver chopped fine after being boiled and seasoned with pepper and salt will be the cheapest mode of providing animal food, and given two or three times a week will make considerable difference in the quantity of eggs in the winter time. Another requsite in the shape of diet is a regular supply of green food to fowls that are penned up daily. If fowls cannot have a grass run during the summer months grass should be cut or pulled, and made fine with shears or machine and thrown into feeding trough or it may be mixed with soft food when the birds must eat their regular portion; the more given the better so long as it is given regularly. In the winter season, cabbage should be supplied them, and also beets cut in pieces will be relished. Fowls thus fed will not require as much water. All refuse should be regularly

BROWN LEGHORNS.

cleared away ; as sanitary laws should be strictly observed with fowls as with human beings, if we expect to have them healthy and profitable. Water should be provided and kept clean. If proper vessels or fountains are used they need only to be changed every two days, excepting during very warm weather when they should be changed as often as possible and kept in the shade Stale or sun-warmed water may lead to cholera and other diseases. Fowls should be kept supplied with gravel and lime ; old mortar will answer if crushed fine.

The Poultry House. Every poultry house should be provided with a dust bath, composed of sifted coal ashes and road dust, and some sulphur should be mixed with it to prevent vermin. If this is attended to, and the house kept clean, there will be little trouble from lice, which are a great annoyance to both attendant and fowl. Avoid all permanent or box-made nests as they become harbors for vermin, they should be kept clean ; roosts should be made moveable and thoroughly cleaned several times in the year and saturated with coal oil to which may be added a little carbolic acid. By paying strict attention to cleanliness in your poultry houses you will not be troubled with red or spider lice, as is often found in the cracks of the wall or on the roosts. They sap the blood from the fowl which become sallow in face and head. Working at night they are not noticed, and many fowls have lost their lives by these night marauders, and fowls thus troubled will not be profitable.

In conclusion I would say that poultry kept judiciously and systematically looked after will yield a good return. We do not advise the laying out of whole farms in poultry runs, and building houses especially for that purpose, but do believe that poultry should have their proper place and be managed with the same care as other stock and by so doing this important branch of farm product will increase, and will not only supply home consumption but will also bring a large revenue to the country.

POULTRY RAISING.

Following is a paper read before the Halton Farmers' Institute, Jan. 5th, 1894, in the Court House, Milton, by John. J. Lenton, Park Farm, Oshawa :

In coming before you to-night my object is to try to induce you to take hold of poultry raising to a much greater extent in the future than you have done in the past. I most decidedly would tell you not to keep a hen on your place if she did not pay, but I know that no other thing you can keep will pay so large a profit as poultry. The object of every person who keeps poultry is to make as much money out of them as he possibly can.

The fancier in order to do this breeds his birds so that they will win for him at the large poultry shows. They are bred for feather, symmetry, size, fine combs, ear-lobes of correct color, and several more points which seem useless to farmers. But do not deceive yourselves, for in nine cases out of ten we find that a bird which is bred to suit the fancier generally proves the most profitable for those who are keeping fowls for either eggs or market fowl. When a fancier once establishes his name amongst the breeders and purchasers of fine poultry he can make more money from one hundred hens than many a one-hundred-acre farmer makes.

Most farmers keep poultry just to eat the screenings, lay a few eggs and raise chickens for the table. This class of people never think that a well-cared-for hen will give a clear profit of at least one dollar per year besides a few eggs for home use. Fowls in summer will nearly keep themselves by picking up stray bits, catching insects, etc., and in winter they will need to have food supplied to them. Now, if it pays to keep a hen it will pay to keep her properly. Poultry poorly attended to will barely pay for their feed, while if they receive good care there is nothing that will pay a larger percentage on the money invested than the much despised old hen. Farmers, give them a fair trial, and you will never regret it.

We often see a small flock of fowls in the towns. Now, what does the townsman keep hens for? Did you ever hear tell of anyone buying unhatched chicks when he thought he was buying eggs or buying stale eggs for fresh ones? I have heard dozens

WHITE LEGHORNS.

of townsmen say that if they were sure of getting what they paid for they would not be bothered with keeping a few hens. Here is another point that our farmers should look after—always market your poultry produce in the best condition, and you will be able to command the highest price.

Again, we occasionally find one who keeps poultry for means of a livelihood. Many, no doubt, laugh at such a person, yet he is generally making more money, doing less work than those who deride his business. Now, let us look at the way he takes to make his profits. His hens are all layers ; all drones are carefully culled out. His hens are laying in the winter, just at the time that eggs are dearest, and as soon as warmer weather comes when everybody's hens are laying and eggs are cheap, he turns his attention to the hatching of chicks. The chicks are ready for market by the time most people are beginning to set their hens, and just at the time they are worth two or three times as much per pound as they will be six or eight weeks later. You don't find three months, droppings in his poultry house, nor is it infested with lice. He knows that fowls pay when rightly looked after, and of course they receive the proper treatment. He bears in mind that they must have a variety of grain. Green food, meat, grit and the dust box are not forgotten, and the water-dish is always filled with clean, warm water.

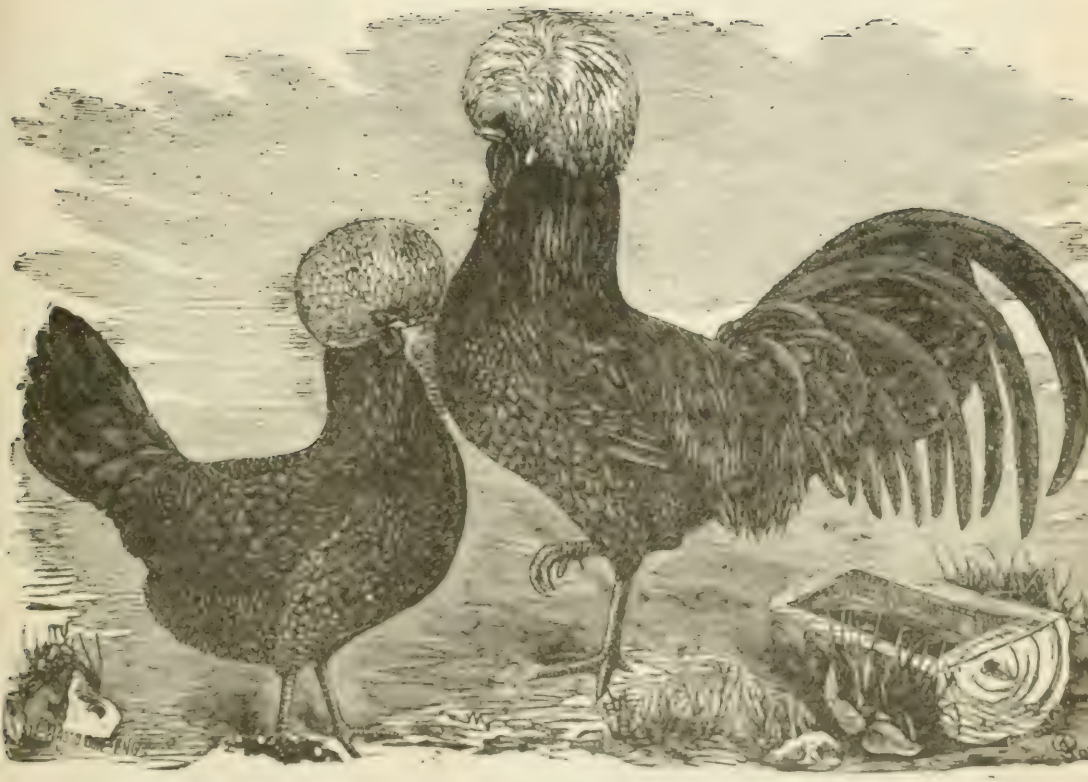
Who should keep poultry? First, those who want to make a large profit on money and time expended. Second, all that have a liking for them and can give them the proper care. If you don't like poultry, leave them alone and let somebody else look after them, for you will never make them pay. The person who has only a small capital cannot do better than put it into poultry. They will yield him a larger profit in a shorter time than any other business. It is conceded by all who properly keep fowls that you can clear from one to two dollars per year on every hen you keep. Now hens can be bought in the fall for thirty or forty cents each, so you see in a year you can make three hundred to five hundred per cent. on the money invested and then you still have your hen at the end of the year. These figures are not the results of an imaginative brain, but have been proved by dozens of our poultrymen.

I wonder if anybody in the room ever stopped to think how many of the luxuries that appear on our tables are provided by the fowls. Think of chicken pie, roast turkey, duck and goose. How much would it cost you a year to buy these if you did not raise them yourselves? No housekeeper can bake her cakes, etc., without eggs and how often do they play a very important part in our meals.

Boys are generally very fond of poultry, and will take good care of them. Give your boy a few chickens so that he may start business in a small way for himself ; it will help him to look after a larger business in the future. Besides if he has something that he can really call his own it will interest him and help to keep him at home. You will also find that he will not require so much spending money from you.

I often wonder which are in the majority, the farmers or their wives, who look after the poultry. Did you ever hear of a woman who made a failure of poultry raising? Well, I never did. Then how is it that lots of women make a success out of it when their husbands have given up in disgust. I believe that it is because they recognize the hen as a means of obtaining gain and treat her as such. It is all in the care that poultry receive that makes them a source of profit. Women see that they get this care while the men neglect them and put all their time on the horses and cattle. We all know that looking after poultry is not one of the most pleasant jobs for women, and if they look after them I think the men should do some of the harder work for them. We heard of one man who made a failure with his poultry, then turned them over to his wife. Of course, she made them pay a big profit. This selfish fellow then claimed the fowls for the following year, but had worse luck than ever. Thinking that he wasn't made for a poultryman he again give the poultry over to his wife. His failure was due to that one word, "carelessness."

Many of our farmers say that it does not pay to keep any more fowls than will pick up the bits, eat the screenings, etc. Well, if poultry pay and they certainly do, farmers can get the full benefit of their profit, for everything necessary to make poultry profitable grows or is found on the farm, whereas the poultryman and others buy their poultry



WHITE-CRESTED BLACK POLANDS

supplies from dealers and have to pay a higher price. Then look at the range fowls can have on a farm. Two hundred hens rightly managed will pay the hired man's wages, besides supplying the home need.

If any man has malice aforethought for poultry, it is the gardener. But, friend gardener, have you ever thought that if you confine fowls in your plum orchard they will pay for themselves ten times over in the increased yield of plums that you will receive. It is a fact that if fowls are confined where the plum trees are that the curculio will not affect the plums. This point alone is enough to recommend them to any one who has a few plum trees. We know of one man whose land was so poor that his cherry trees barely yielded enough for his own use, but in three years' time by keeping one hundred hens on every acre of cherry orchard, this orchard gave him a net profit of over one hundred dollars. Poultry greatly enrich the land, besides killing many insects injurious to fruit and vegetables.

Bee-keepers should also keep fowls, for in the summer the bees need most of the attention, and the fowls harldly any while in the winter this is the reverse. In this way there is a double profit—that from the bees and that from the poultry.

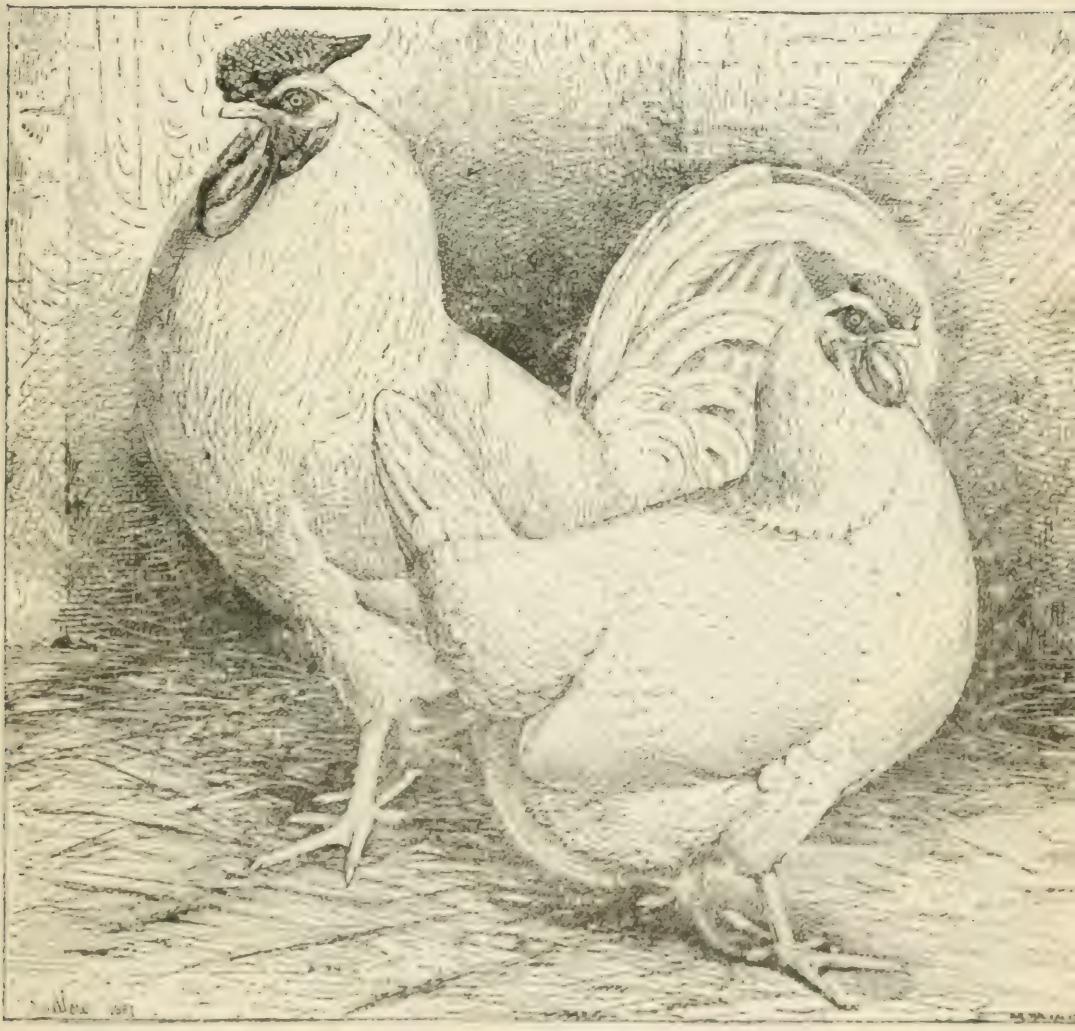
The laboring man will find that a couple of dozen hens will greatly assist in supplying his table. Business and professional men can find a pleasant recreation in breeding fancy poultry ; and some of our most enthusiastic fanciers began that way.

How is it that there is such a diversity of opinions on the poultry question. One man declares that poultry are a nuisance, that they eat their heads off, and a lot more that is dead against the poor old hen. Another says he can make lots of money out of them. Now, why this difference of opinion? We know that the man who is making money out of them gives them the proper care, etc. But how does the other fellow act towards his fowls? In all probability they are scarcely sheltered from the weather. Poor feed and not much of it will not help them any. Lice and filth in summer or winter do not assist the fowls to fill the egg basket or render any assistance to the growing chicks. Give your fowls proper treatment, and they will treat you properly.

In reading the poultry journals there is scarcely an issue but the question, "can I make a living out of poultry?" appears. Well, now, how does anyone know whether so-and-so can make a living at poultry-keeping because somebody else does so? Probably the inquirer has failed in every business that he ever attempted ; how then can he expect to make poultry pay? What kind of a living does he want? We know of some breeders who are making $1,500 to $3,000 a year out of poultry ; surely that is a good living. The man who keeps as many fowls as he can look after himself can make a good living. Never trust any one to look after them for you, because neglected fowls are an expense to any man. Then the breed is another important question, but the breed you select should depend on whether you want eggs, dressed poultry or the both combined, as far as possible, in the one breed.

If you want eggs get a breed that belongs to the Mediterranean class. Leghorns and Minorcas are the best. The Leghorns have been styled "the egg machines of the nineteenth century." They are a very lively bird, always on the go. Disease seldom comes their way. Their large comb, however, is an objection to them in winter. It is so apt to freeze, especially if they go out of doors. The rose-combs are, therefore, to be preferred on this account. The Minorcas are larger than the Leghorns and they also lay a larger egg. This breed is the strongest rival that the Leghorns have. The black Spanish, an old favorite, has been nearly replaced by the Minorca. Andalusians are very good layers, but are hard to raise and their color does not add to their popularity. The Hamburgs are also good layers, but their eggs are small, and the birds are very hard to keep through the fall and winter.

The Asiatic class includes the largest breeds we have. To it belong the Brahmas, Cochins and Langshans. Of all these the light Brahma is the most popular. As well as being the largest it is one of the handsomest breeds in existence. This class all have feathered legs which is an objection to them when on a farm in the winter because in the day-time, when out scratching in the barn-yard, these feathers become damp, and at night



PAIR WHITE DORKINGS.

if they don't have a very warm house, their feet are easily frozen. They are also great eaters, but the Brahmas if fed too much fattening food in the winter, will not lay and they are exceptionally good layers at this season of the year. Cochins are persistent sitters and many object to them on this account. The Langshans are the best laying breed in the whole Asiatic class. Their flesh is considered of extra fine quality.

The Dorkings are considered one of the finest table birds that we have. They have more breast meat than most breeds. The climate of Canada, however, hardly suits them, for the damp weather in the fall and winter often gives them the roup. They must be kept in a warm, dry, roomy place and then they are a fine breed.

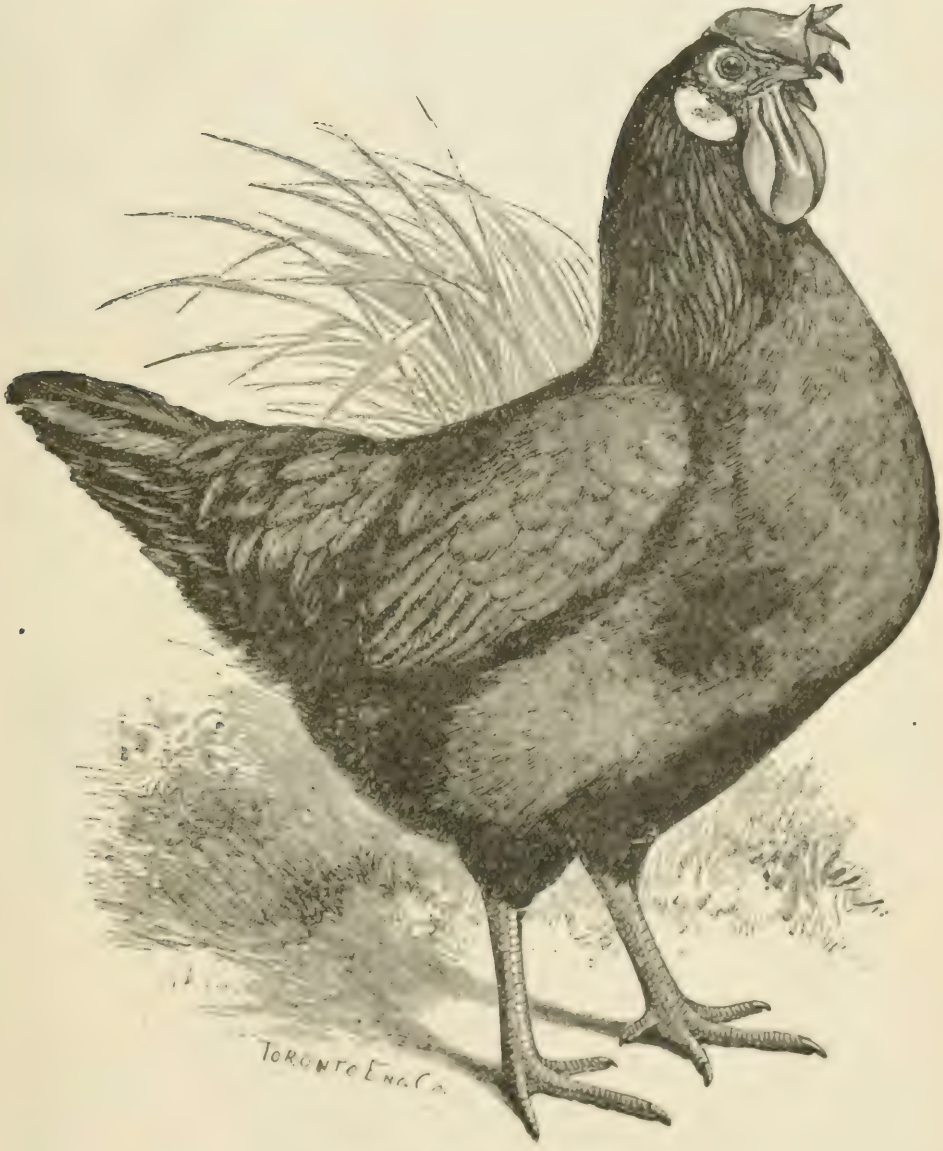
The French class includes the Houdans, Crevecœurs and La Fleche. They are all fine table birds. The La Fleche, we think, should be given a trial by our farmers. All having crests they are at a disadvantage when hawks are around, for they cannot see the hawks until it is often too late. They are fair layers and fairly hardy.

The fowls which we find on the farm (if they are pure bred) generally belong to the American class. They are the general purpose and all-round fowl, so called because they are good layers, good table birds and very hardy. To this class belong the Plymouth Rocks, Wyandottes, Javas, Dominiques and several other newly originated varieties. The Plymouth Rocks, perhaps, are the best known. They are fair layers and good table birds. Some complain that they are great sitters, but we find that it is only a half-bred Rock that possesses this feature to any great extent. Their hardiness is a very important point and should be noted by all farmers. The Wyandottes are not such an old breed as the Rocks, but they are rapidly becoming very popular. They are not quite so heavy a fowl, but their bodies are plumper and they are also better layers, especially in winter. The are even hardier than the Rocks and are more active. Another strong point in their favor is that they are very small eaters. The Javas are larger than the Rocks, but resemble them closely in most respects. The Dominiques are smaller than any of the other breeds in this class. equally as hardy and as good layers. Their size, however, does not make them so desirable as some of the other breeds.

The Games are seldom found on a farm. People believe a bird that is called a Game will fight anything that comes along. Fanciers have now-a-days so bred the games that in some varieties scarcely any of this pugnacious feature remains. The Game is an excellent table fowl, fair layers and fairly hardy. The Indian Game has attracted a great deal of attention in the last two or three years. They are one of the finest table fowls that we have—are ready for the market at any age. It is common thing for an Indian Game cock to weigh eleven and twelve pounds and some have weighed fourteen each. The hens are good layers if not fed too heavily.

Turkeys are another source of great profit to farmers. They are not so hard to rear as is generally supposed. Keep them free from lice and filth and do not let them get wet for the first month of their lives. The demand for turkeys is rapidly increasing. It is seldom they sell for less than 12½ cents per pound, and the supply is sometimes scarce at that. Last year we sold some for 14 cents a pound and in February they were 15 and 16 cents a pound. A good young Bronze hen will dress 10 or 11 pounds at Xmas and a gobbler 15 to 17. You can now figure for yourself the average price of a turkey. Buyers annually ship great numbers to the United States. They are also shipped to England, and there sell for a shilling per pound. One great drawback in raising turkeys, and the same may be said of fowls of all kinds, is that people will inbreed their stock. An inbred fowl is always smaller and not nearly so hardy as those bred from unrelated stock. It costs just as much to raise a small turkey as a large one, and because we can make more money of large turkeys those are the kind to raise. There are several different varieties of turkeys, but to our idea the Bronze is the hardest, most easily reared, grows to a large size and is much tamer and more quiet than the other kinds.

Geese can also be be made to yield a fair profit. We believe, however, that they should only be kept where they have easy reach to a watering-place. Geese will live in the pasture from the time they are two weeks old until late in the fall, when they should be fed for market. Some object to them on account of their being a somewhat uncleanly



BLACK MINORCA PULLET.

fowl, but we think that if you have water running through your place it would be easy to fence off a small patch for their use. The feathers of the goose are very valuable, and as they can be picked at least twice before the final picking, they can be made to pay quite a profit in this way.

Ducks are generally termed "the birds that shovel in their feed." It is true that they are pretty large eaters, and it is also true that they grow wonderfully fast. Ducks do not need so much water as is generally supposed. When they are hatched, put them in a small run and give lots of feed. In about ten weeks they will be ready for market, and if kept longer the profit will soon grow less, which will not suit the owner. It is very important to select some good breed. Small ducks are not profitable. The Pekin variety is one of the best that we have. They are white in color, great layers and quick growers. The Aylesbury and Rouen are also very good, the latter being a parti-colored duck.

We know that farmers have not been very successful in poultry-raising in years past simply because they believed they would not pay and did not try to make them do so; but every succeeding year discloses to us the fact that no other branch of the farm is so profitable as poultry. Farmers, give your fowls a fair chance, and you will not need to complain of hard times.

SOME EGG STATISTICS.

Exports of Eggs from Canada.

Year June 30.	To Great Britain.	To United States.	Total Exports.
	dozen.	dozen.	dozen.
1884		11,384,856	11,490,855
1885		11,542,279	11,542,703
1886		12,708,883	12,758,582
1887		12,907,956	12,945,826
1888	2,379	14,147,739	14,170,859
1889	85	14,011,017	14,028,893
1890	3,600	12,825,985	12,829,660
1891	649,476	7,354,285	8,022,965
1892	3,987,655	3,913,615	7,981,264
1893	4,104,682	2,664,942	6,805,482

Imports of Eggs into the United Kingdom.

——	Quantity.	Value per 120.	Total value.
	Great hundreds. (120)	$ c.	$ c.
1880	6,228,405	1 75	10,877,784 00
1887	8,356,568	1 68	14,163,400 00
1890	10,291,246	1 62	16,684,570 00
1891	10,628,214	1 65	17,057,919 00
1892	11,139,419	1 66	18,465,098 00

IMPORTS OF EGGS INTO THE UNITED KINGDOM BY COUNTRIES IN 1892.

Countries.	Quantity.	Value per 120.	Total value.
	Great hundreds.	$ c.	$ c.
France	3,512,174	1 99	6,993,429 00
Germany	2,751,340	1 50	4,025,131 00
Belgium	1,985,768	1 54	3,061,999 00
Denmark	1,247,968	1 70	2,011,940 00
Russia	1,254,323	1 38	1,725,994 00
Canada	248,764	1 64	404,000 00
United States	42,125	1 80	76,056 00
Portugal	27,213	1 81	49,283 00
Sweden	24,119	1 60	38,631 00
Spain	13,997	1 94	27,138 00
Holland	10,819	1 61	17,391 00
Other Countries	20,809	1 64	34,106 00
	11,139,419	1 66	18,465,098 00

EXPORTS OF EGGS FROM UNITED STATES YEAR ENDING JUNE 30, 1892.

Country to which exported.	Quantity.	Value.
	dozen.	$ c.
Canada	133,579	20,987 00
Bermuda	11,642	2,561 00
Hawaii	11,160	2,924 00
South America	9,575	1,967 00
Mexico	9,808	2,158 00
All other	7,299	1,777 00
	183,063	32,374 00

IMPORTS OF EGGS INTO UNITED STATES.

Years.	Total imports of eggs into United States.		Total imports of eggs into United States from Canada.	
	Quantity.	Value.	Quantity.	Value.
	dozen.	$ c.	dozen.	$ c.
1885	16,098,450	2,476,672 00	13,969,474	2,036,437 00
1886	16,092,583	2,173,464 00	13,465,764	1,808,672 00
1887	13,936,054	1,960,396 00	13,682,914	1,930,844 00
1888	15,642,861	2,312,478 00	15,256,558	2,262,815 00
1889	15,918,809	2,318,976 00	15,370,061	2,345,715 00
1890	15,062,796	2,074,942 00	14,917,912	2,068,086 00
1891	8,232,043	1,180,595 00	8,095,675	1,177,831 00
1892	4,188,492	522,240 00	4,021,637	510,594 00

REPORT ON THE WORLD'S FAIR EXHIBIT.

The following is a copy of the report made to the Ontario Commissioner by Mr. Allen Bogue, Superintendent of the Ontario Poultry Exhibit at the World's Fair :

N. Awrey Esq., M.P.P.,
Ontario Commissioner to the World's Fair.
Chicago, Ill.

Dear Sir,—I have the honor to forward you, as Superintendent of the Ontario Poultry Exhibit at the World's Fair, my report and a comparative statement, which I have endeavored to make as complete as possible from the means and information at my command, and I am proud to say that the facts as set forth form a very favorable showing indeed, comparing the poultry industry of Ontario with that of our neighbors, the United States.

It has been my desire in preparing the following statement to furnish as much data as possible to enable you to arrive at any further information or comparisons you may for publication not set forth in my recapitulation.

The extent of the great Fair, or any of the many qualities pertaining thereto, have been carefully omitted from this report, knowing that your personal knowledge was far in excess of mine, and that you are in possession of all the points and better able to touch upon them than I.

The poultrymen of Ontario are to be congratulated upon the hearty manner in which they responded to the request of the Government to make such a display as would be a credit to the Province in the poultry industry. They did so, and have opened the eyes of the world in regard to poultry-raising in Canada. The marked success that attended us in the awards has surpassed our most sanguine expectations, and had it not been for the radical changes in the mode of entry made by the Fair managers at the last minute our display and prize winning would have been even larger and more successful.

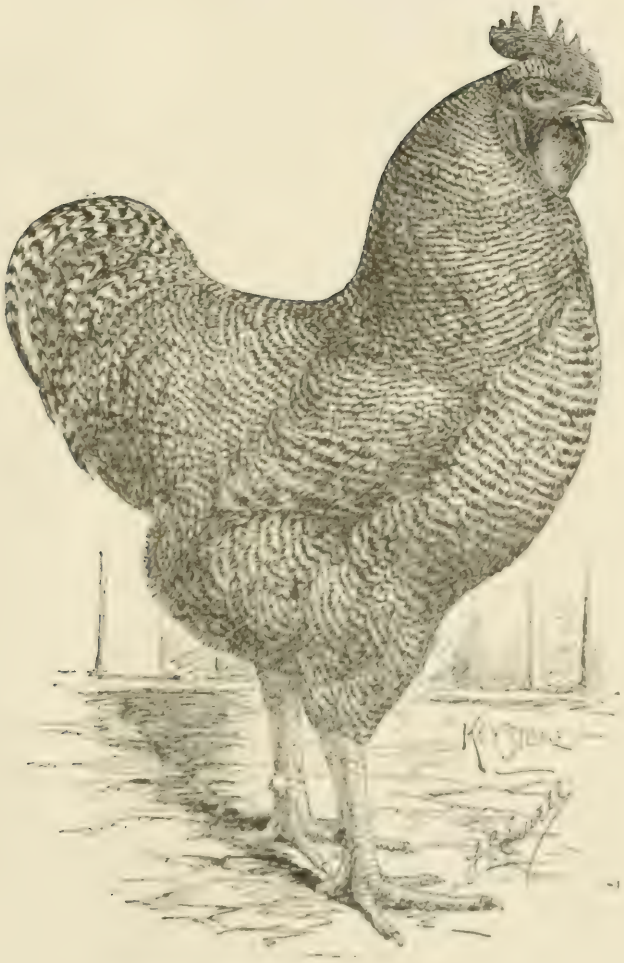
In considering the exhibit and results, it must be borne in mind that the United States have a very much greater population to select birds from, and, if possible, were more interested in the success of their great undertaking generally than any other people, and more particularly as to their standing in the schedule as prize-winners in this and all other departments of competition. With this object in view they made as complete an entry as possible of the very best selected birds to be had throughout their vast territory. Notwithstanding all this, the Province of Ontario did secure more than its proportionate share of the cash prizes and honor ribbons. We also found a ready market for all our surplus stock, the sales made amounting to something over fifteen hundred dollars.

The number of specimens on exhibition was 3,373 ; 2,904 fowls and 469 pigeons and pets, Ontario showing of these 883 fowls and 155 pigeons and pets.

The appended statement will furnish all information.

Your obedient servant,

Allen Bogue,
Superintendent.



BARRED PLYMOUTH ROCK COCK.

Poultry and Pet Stock Awards at the World's Fair.

Varieties.	No. of Prizes Won.								Amount of Awards.		
	By Ontario.				By United States.				Ontario.	United States.	Total.
	1st.	2nd.	3rd.	4th.	1st.	2nd.	3rd.	4th.			
									$	$	$
Plymouth Rocks.											
Barred	.....	.....	.....	.....	5	5	4	3	.....	93	93
Pea Comb	.....	.....	.....	.....	.....	3	2	.....	.....	21	21
White	1	3	1	.....	4	2	3	4	28	67	95
Total	1	3	1	.....	9	10	9	7	28	181	209
Javas:											
Black	4	4	2	3	1	1	2	1	72	23	95
White	.....	.....	.....	.....	2	.....	.....	.....	.....	20	20
Total	4	4	2	3	3	1	2	1	72	43	115
Wyandottes:											
Silver	.....	.....	1	1	5	5	3	3	5	90	95
Golden	.....	.....	.....	1	5	3	3	2	2	78	80
White	1	1	1	3	4	4	3	.....	24	69	93
Total	1	1	2	5	14	12	9	5	31	237	268
Dominiques	1	2	.....	.....	2	1	2	.....	20	31	51
Brahmas:											
Light	.....	.....	.....	1	5	5	4	3	2	93	95
Dark	1	2	1	.....	4	3	3	2	23	68	91
Total	1	2	1	1	9	8	7	5	25	161	186
Langshans:											
Black	2	3	3	.....	3	2	.....	3	44	46	90
White	.....	.....	.....	.....	4	.....	.....	.....	.....	40	40
Total	2	3	3	.....	7	2	.....	3	44	86	130
Cochins:											
Buff	1	3	2	2	4	2	2	2	35	60	95
Partridge	1	1	.....	1	4	4	3	2	17	73	90
White	2	1	1	1	3	4	3	2	30	63	93
Black	3	4	1	1	2	1	3	3	55	40	95
Total	7	9	4	5	13	11	11	9	137	236	373
Leghorns:											
S. C. Brown	.....	1	2	.....	5	4	2	4	11	84	95
R. C. Brown	.....	.....	3	1	5	5	1	2	11	82	93
S. C. White	.....	.....	.....	.....	5	5	4	4	.....	95	95
R. C. White	1	.....	1	.....	4	3	1	1	13	60	73
Buff	.....	.....	.....	.....	4	3	2	.....	.....	61	61
Black	2	1	.....	1	3	4	3	1	27	61	88
Total	3	2	6	2	26	24	13	12	62	443	505
Minorcas:											
Black	.....	.....	1	.....	5	4	3	4	3	87	90
White	.....	.....	2	.....	5	3	.....	.....	6	65	71
Total	.....	.....	3	.....	10	7	3	4	9	152	161
Andalusians:											
Blue	.....	4	4	1	4	1	.....	2	34	49	83
Spanish:											
Black	3	3	1	1	2	1	2	1	50	33	83
Polish:											
W. C. B	4	3	2	.....	1	1	1	.....	61	18	79
Silver	5	1	.....	.....	.....	.....	.....	.....	55	.....	55
Golden B	5	4	.....	.....	.....	1	.....	.....	70	5	75
White B	5	3	.....	.....	.....	.....	.....	.....	65	.....	65
Golden	5	4	4	2	.....	.....	.....	.....	86	.....	86

POULTRY AND PET STOCK AWARDS.—*Continued.*

Varieties.	No. of Prizes Won.								Amount of Awards.		
	By Ontario.				By United States.				Ontario.	United States.	Total.
	1st.	2nd.	3rd.	4th.	1st.	2nd.	3rd.	4th.			
									$	$	$
Polish :—*Continued.*											
White	5	1	1			4	1		58	23	81
Silver B	5	5	1	1			3	2	80	13	93
Total	34	21	8	3	1	6	5	2	475	59	534
Hamburgs :											
G. S	4	4	4	2	1	1		2	76	19	95
S. S	1	1	1	2	4	4	3	2	22	73	95
G. P	3	5	2	3	2		2	1	67	28	95
S. P	4	5	2	1	1		2	3	73	22	95
Black	5	3	1	2		2	3	1	72	21	93
Total	17	18	10	10	8	7	10	9	310	163	473
Red Caps	4	1	2		1	3	1	2	51	32	83
French :											
Houdans	1	1	2	2	4	3	1	1	25	60	85
Creve Cours	4	1							45		45
La Fleche	2	2	1						33		33
Total	7	4	3	2	4	3	1	1	103	60	163
Dorkings :											
White	5	4	1						73		73
Silver Gray		3			5				15	50	65
Colored	3				1	4	1		30	33	63
Total	8	7	1		6	4	1		118	83	201
Game :											
B. B. Red	4	5	2		1		2	4	71	24	95
Bro. Red	5								50		50
G. Duckwing	5	1							55		55
S. Duckwing	2								20		20
Red Pyle	4	1				3	2		45	21	66
White		1			5	2	1		5	63	68
Black					1					10	10
Sumatra	3								30		30
B. B. R. Malay					1	1				15	15
Pit					3	3	2	2		55	55
Total	23	8	2		11	9	7	6	276	188	464
Game Bantams :											
B. B. Red	3	2	4		2	3			32	22	54
Bro. Red	4	1			1	1			37	9	39
G. Duckwing	4	1			1	1			27	9	36
S. Duckwing					2	2				18	18
Red Pyle	2	1	2		3	3	2		19	31	50
White	2	2			2	2	1		18	20	38
Black					3					18	18
Cornish Ind	1	1	1		4	3	3		11	39	50
Total	16	8	7		18	15	6		134	166	300
Bantams :											
Golden Sebright	4	1	2		1	4	2		31	23	54
Silver "		1	2		6	4	2		7	47	54
White Booted	3								18		18
Japanese	5	3	2			2	2		44	10	54
R. C. Black "	5	5	2				1		30	2	32
Buff Cochin	1	3	2		4	2	2		19	35	54
White "		2			2				6	12	18
Black "					5	4				42	42
W. C. B. Polish	3	1	2		1	1			24	9	84
Total	21	16	12		18	17	9		200	180	380

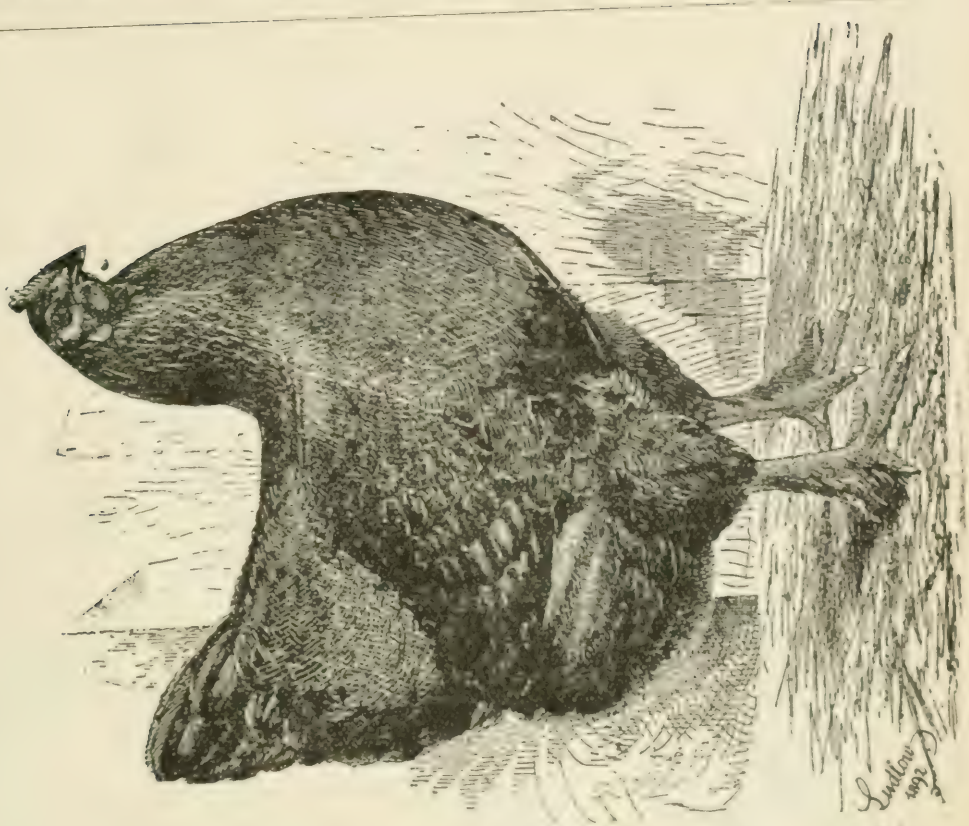
POULTRY AND PET STOCK AWARDS.—*Continued.*

Varieties.	No. of Prizes Won.								Amount of Award.		
	By Ontario.				By United States.				Ontario.	United States.	Total.
	1st.	2nd.	3rd.	4th.	1st.	2nd.	3rd.	4th.			
									$	$	$
Silkies	4								24		24
Sultans	1								6		6
Frizzels					4					24	24
Total	5				4				30	24	54
Turkeys :											
Bronze					2	2	2			40	40
Slate					1	1				20	20
White			2		2	2			8	32	40
Black					2					20	20
Total			2		7	5	2		8	112	120
Ducks :											
Pekin		1	1		1				6	8	14
Aylesbury	1		1			1			10	4	14
Rouen		1	1		1				6	8	14
Cayuga	1					1			8	4	12
East India					1					8	8
Crested White					1					8	8
Muscovy					1					8	8
" Colored					1					8	8
Gray Calls					1					8	8
White Calls					1					8	8
Total	2	2	3		8	2			30	72	102
Geese :											
Toulouse	1	1					1		12	2	14
Canadian Grays					1	1				12	12
Embden		1			1				4	8	12
Chinese Brown					1					8	8
" White			1		1	1			2	12	14
Total	1	2	1		4	2	1		18	42	60
Pigeons	49	41			116	62			278	588	866
Pheasants	6								36		36
Pea Fowl					1					6	6
Pearl Guinea Fowl	1					1			6	3	9
White Guinea Fowl					1					6	6
Total	1				2	1			6	15	21
Rabbits	2				3				4	6	10
Pets	3				2	2			24	16	40
Total	5				5	2			28	22	50
Grand Totals	222	164	78	33	312	216	101	69	2,613	3,458	6,071

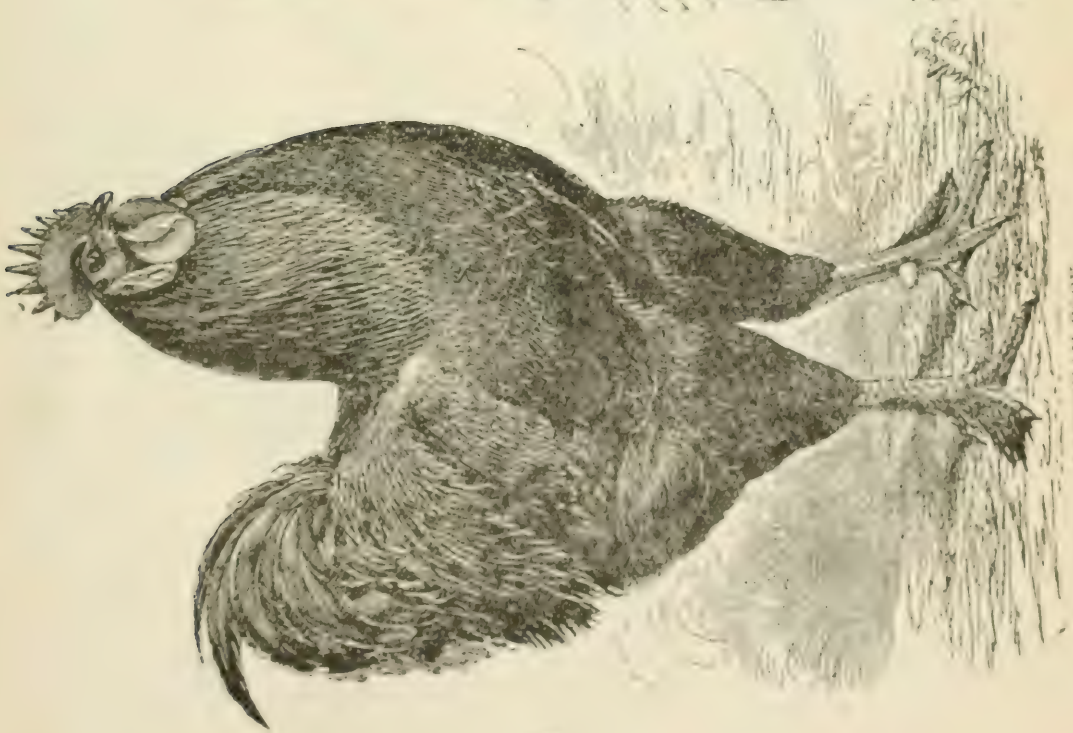
BLACK HAMBURG HEN

LIST OF SUCCESSFUL POULTRY EXHIBITORS AT THE WORLD'S FAIR.

Name of Exhibitor.	Address of Exhibitor.	Awards.	
		No.	Amount.
			$ c.
John Brown	Toronto	2	8 00
John Colson	Guelph	3	17 00
C. J. Daniels	Toronto	18	108 00
G. G. McCormick	London	18	111 00
William McNeil	London	106	712 00
J. E. Meyer	Kossuth	1	2 00
Wm. Ferguson	London	1	3 00
George Bogue	Strathroy	3	20 00
C. S. Jackson	International Bridge	8	33 00
L. Sage	London	4	23 00
R. M. McCurdy	London	5	28 00
Fred. Goebel	New Hamburg	1	10 00
Ed. Donnelly	Sandwich	1	3 00
F. C. Hare	Whitby	4	25 00
Bartlett & George	London	4	26 00
Thomas Cockburn	Hamilton	2	8 00
J. H. Saunders	London	3	10 00
G. S. Robson	London	2	5 00
Haycock & Kent	Kingston	2	6 00
John Schuler	New Hamburg	2	20 00
R. Scott	London	3	9 00
W. H. Dustan	Bowmanville	4	16 00
M. T. Burns	Tilsonburg	6	34 00
C. Stockwell	London	4	16 00
Richard Oke	London	46	241 00
A. Bogue	London	46	291 00
G. W. Loans	London	3	11 00
D. Bogue	Lambeth	10	45 00
H. Emerick	International Bridge	3	11 00
J. T. Williams	London	2	5 00
Dr. J. S. Niven	London	3	8 00
Wm. M. Smith	Fairfield Plains	5	22 00
William Barber	Toronto	41	295 00
Wm. McLoud	London	7	27 00
W. J. James	St. Thomas	3	13 00
H. B. Donovan	Toronto	Poultry. 14 / Pigeons. 90	329 00
C. H. Thompson	St. Thomas	3	16 00
W. H. Gaze	London	10	30 00
A. Thompson	Allan's Corners	2	8 00
J. Hord	Parkhill	1	8 00
Total		496	$2,613 00



LANGSHAN HEN.



LANGSHAN COCK.

COTTAGE POULTRY-KEEPING.

By George F. C. Pyper, in the Journal of the Bath and West of England Society, 1893-4.

Individual Organization.

The cottager's poultry should consist entirely of hens or pullets, and the owner should be dependent on outside sources for the supply of fertile eggs for hatching.

It is here that one advantage of individual control appears. The breeding pens are then under the complete and sole direction of the organizer, who would obtain the necessary supply of eggs for hatching from a source where the stock had been selected with judgment, and allowed ample space to roam. Chickens would consequently be produced, which, for vigorous constitution and early maturity, would be far in advance of the produce of birds reared in the cottager's confined space.

It will be seen that by this method but few male birds would be required to supply the whole of a village with the requisite number of eggs for hatching, and the waste caused by keeping a cock in every cottager's run would be avoided. Uniformity in the produce, too, is an advantage both to the seller and to the poultry dealer.

It is a generally received opinion, too, that hens in confined runs lay better during the winter for the absence of a male bird, and there is less probability of their contracting the evil habit of feather eating, which birds in close confinement are apt to fall into. Where, however, there is suitable space, and a distinctly expressed inclination to keep a pen of birds with a cock, it should be encouraged It is always advisable to allow as much scope as possible to individual ideas.

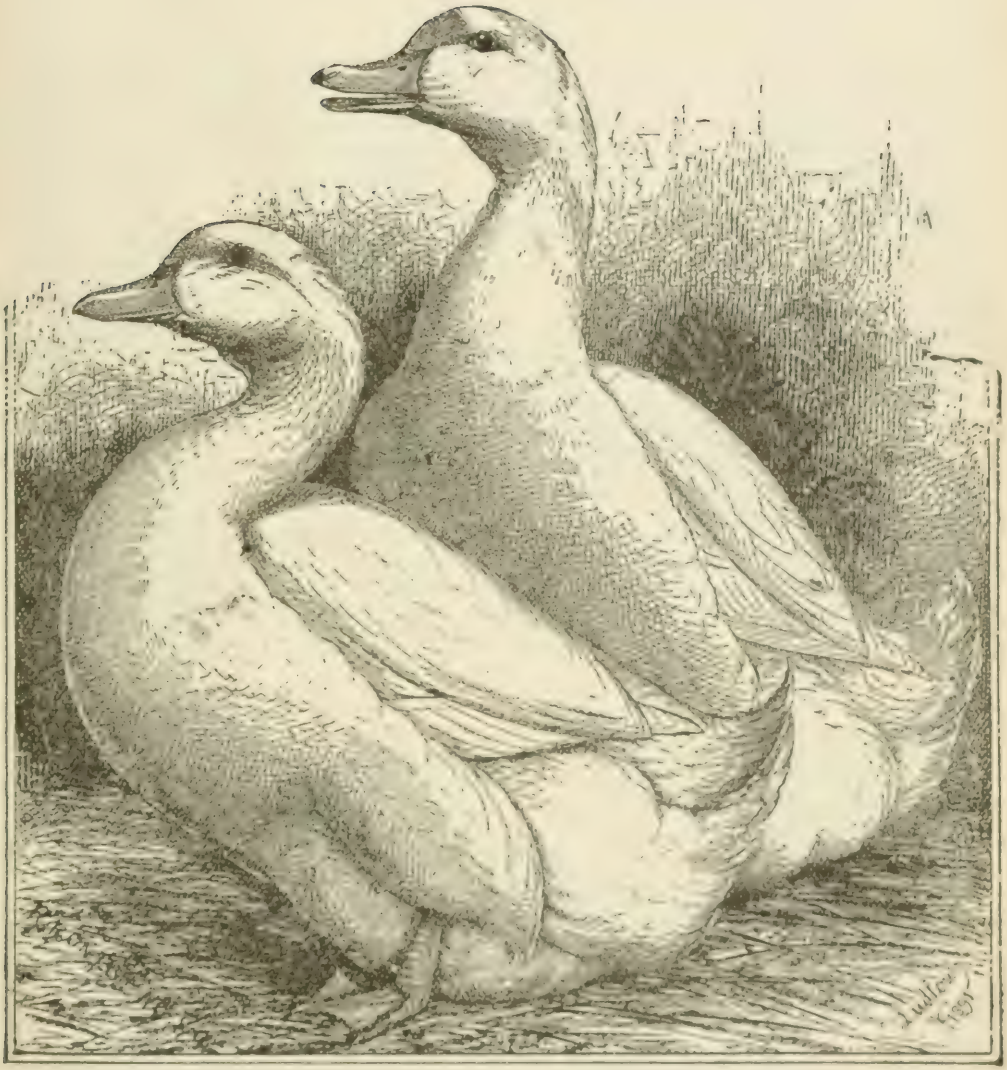
Cottagers already keeping poultry might exchange their eggs for those from the specially selected stock provided; and those commencing could compound for one or more sittings of eggs by returning a chicken for each brood at three months old, and so making the transaction a fair and business-like one.

Not the least important part of such a scheme as is here outlined is the selection of the variety or varieties to form the breeding pen, which must to some extent be governed by the objects for which the birds are required, whether for egg production or for table purposes.

Table Poultry.

Experiments for the past six years with Dorkings, Houdans, Minorcas, Langshans, Indian Game, and their crosses, indicate that the most suitable for the soil and climate of the west of England will be found in a cross of the two last-named breeds. A Langshan cockerel mated with Indian Game hens will, if the chicken be hatched in February March or April, produce birds which will in the summer be in every way superior to the ordinary local product, and will fetch a correspondingly better price. Carefully selected birds are absolutely necessary, and the selection should, therefore, be made by one acquainted with the points requisite for the production of profitable table fowls, which should be, at the same time, of prime quality, avoiding, as a rule, birds bred specially for exhibition. This cross conforms most readily to the requirements of cottagers, in consequence of its adaptability to the confined space available, and its early maturity and consequent excellence on the table. This latter quality is not identical, as many appear to imagine, with another quality which this cross also possesses, that of being a first-rate bird for disposal in the market.

Probably those cottagers who at first are disinclined to believe in the superiority of properly selected breeds, will be converted when they see their neighbor's birds selling at higher prices than their own, and will be convinced that the present farm-yard system of



PAIR PEKIN DUCKS.

unprofitable mongrelism, which even the frequent introduction of pure strains on the male side fails to wholly remedy, will never help the right side of their balance-sheet. The desired result will only be obtained by the exercise of the same care in selecting stock poultry as that which is found necessary in the more important branches of agriculture.

Egg Production.

Where the object of poultry-keeping is chiefly to supply eggs, the Langshan is an ideal cottager's breed. It does not unduly fatten in confinement, as Dorkings and the Asiatic breeds do, and the tendency to sit, which is characteristic of the Cochin and Brahma and their crosses, is overcome, in from three to five days, by the use of a coop with a barred floor. Minorcas, Leghorns, or other summer layers will, though laying a large number of eggs during the year, be found altogether out of place in the country where, from March to June or later, eggs are frequently sold at from twenty to twenty-four for a shilling, a price at which no cottager could dispose of them profitably.

In an account, kept from October, 1892, to May, 1893, of the eggs laid by two Langshan pullets hatched on March 23rd, 1892, it is recorded that they began to lay on October 21st and 25th, respectively, and continued up to April 25th and 26th, 1893, laying during that period 297 eggs.

The fallacy of considering the number of eggs laid by a hen in the course of a twelve month, as a criterion of its worth is shown in this instance. Had the same number of eggs been laid from March to September, instead of from October to April, their money value would have been little more than half, although the same expense for food and labor would have been entailed.

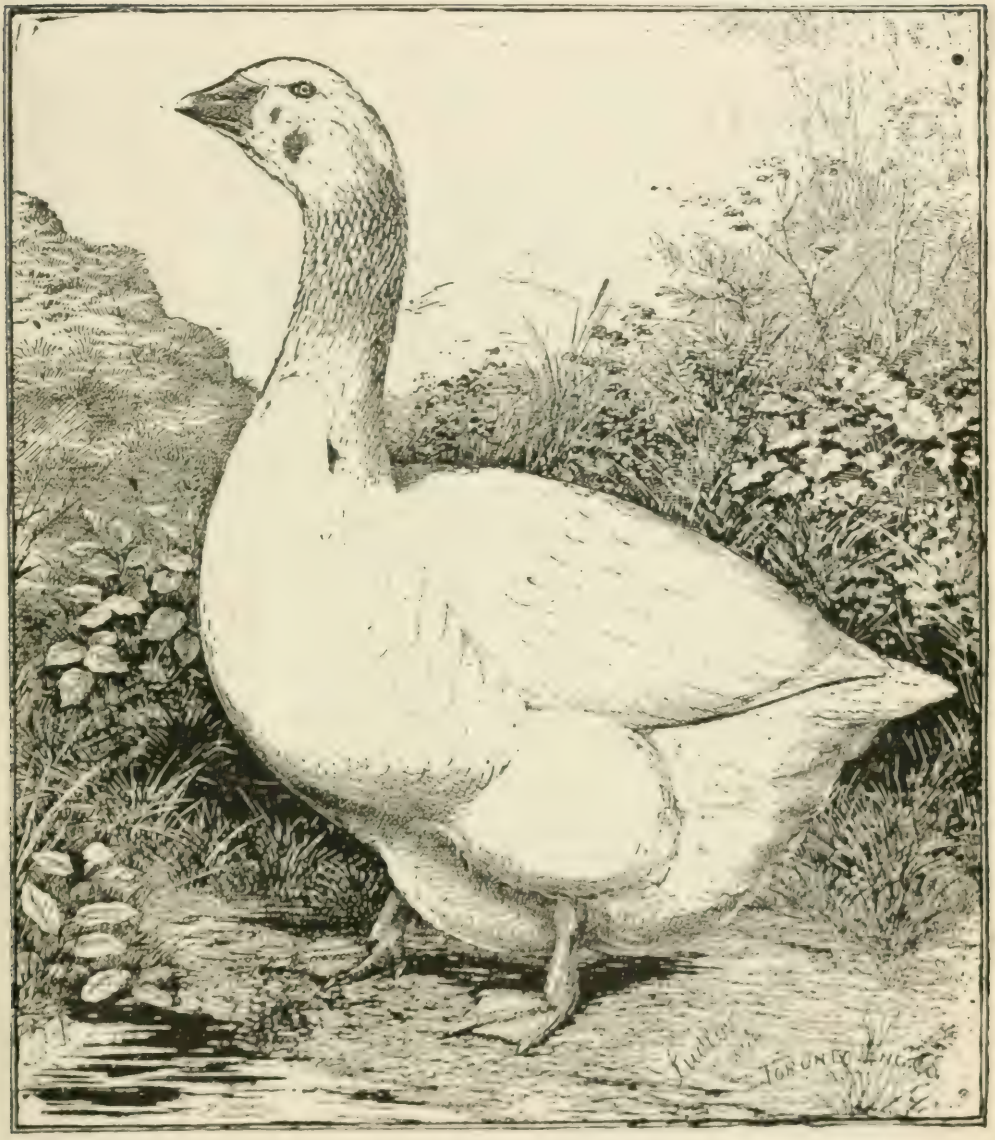
The attractive color of these eggs, varying from chocolate to pink buff, is also a matter of consideration to the seller. Though there is no hidden virtue in eggs with brown or tinted shells, they are, as a rule, disposed of more readily than the white-shelled ones. It may be that even the practical housekeeper is imperceptibly acquiring æsthetic tastes, which find their outward expression in the choice of a tinted egg.

Methods of Feeding.

Two errors, of frequent occurrence, both of which are productive of loss and disease, should be noted and deprecated, viz., irregular feeding and over-feeding. With the quality of the meal or corn secured and its price to the cottager kept within a margin of the wholesale cost, there will be but little difficulty in proper feeding—each cottager supplementing his bought feeding stuff with the produce of his garden or allotment and the hedgeside.

Barley-meal, sharps or bran mixed with waste potatoes and other vegetables from the garden, should form the first meal each day. The vegetables having been boiled, the meal must be added and given hot, the ingredients being varied as far as possible. Three hedge weeds are valuable adjuncts to these meals—nettles, dandelions and goose grass, sometimes called catch-weed or cleavers (*Galium aperine*). Their blood-purifying qualities (on account of which the old herbals recommend them) render all these especially suitable for birds kept closely confined; and, as during the spring and summer they can be obtained by the children without cost, they should form a considerable addition to the ordinary food and be given fresh as green food, or boiled and mixed with the meal.

All green food should be fresh and dry (*i.e.*, not gathered immediately after rain), and supplied daily. It should be suspended in the run so as to avoid contact with fouled ground, and afford exercise for the birds in obtaining it. In winter, mangolds may be substituted. This will be a sufficient supply of food until the evening, when either wheat, barley or oats, in quantity such as the birds will quickly clear up, should be given.



EMBDEN GANDER.

Maize should only be used, and then in a crushed state, during the early summer or at wet periods, in order to hasten the development of cockerels destined for the table. Common, unhusked rice may profitably be given in conjunction with the maize.

While no economy is effected by the use of inferior grain, good sound barley of bad color, when it can be obtained at a lower rate than usual, is a cheap food, especially for winter use.

Rearing Chickens.

The various details of hatching and rearing may well be left to the individual cottager's own experience, the latter being supplemented by what he may learn, as opportunity offers, from his neighbors, or from one of the published guides to poultry rearing. Two very general faults may be pointed out. First, the selection of a dry intsead of a moist place for the nest, moisture being a great aid to successful incubation; and, second, the mode of preparing the first food for the chicks after hatching. This is usually hard-boiled eggs mixed with bread crumbs or oatmeal, which, after short exposure to the air becomes dry, horny and uninviting. Instead of this method of preparing the first food, beat up the egg with two teaspoonfuls of milk, adding sufficient bread crumbs to make the whole into a fairly moist paste. This should constitute the food for the first few days. It should be followed by groats and small seed, with some animal food when insects, worms, etc., are unobtainable, and some finely-chopped lettuce or onion tops. In a fortnight or three weeks this can gradually be dispensed with and the ordinary adult food substituted.

As soon as the sex of the chicken can be distinguished it is an advantage to separate the cockerels from the pullets. With the limited accommodation of a cottager, however, this would generally be found inconvenient, if not altogether impracticable. The result of this separation is an increased growth and development, as well as, in the case of the cockerels, better quality of flesh and a more attractive appearance when prepared for table. If this were explained to cottagers they might, in many cases, arrange to exchange chickens and each keep one sex only.

The cockerels in each brood should be killed off as opportunity offers, and the pullets reserved for laying. At the end of two years, when they have finished laying a batch of eggs, all hens should be killed, and if in good condition, as they probably will be, they should, in the early spring, bring remunerative prices.

Houses.

In order that no cottager may commence at a disadvantage, the first step should be to see that all existing houses and enclosed runs are thoroughly fumigated or otherwise cleansed, so as to free them from the vermin pests which do so much to retard the growth and egg production. Many poultry keepers, being unaware of the actual money loss entailed, take no steps to this end.

Where the house can be securely closed, fumigation should be resorted to. Half a pound of sulphur placed on an iron shovel or old frying pan, set on fire and then allowed to remain an hour or more with the house shut up will be found effectual, and this should be followed by a thorough lime washing, half a pint of paraffin being mixed with each gallon of limewash. All birds occupying such houses should also undergo a similar cleaning process, pyrethrum powder being dusted over the plumage and well rubbed in under the wings.

Where the houses have to be erected and there is a choice of situation, a south or south-west aspect should be selected, and a high and dry, in preference to a low, moist spot, be chosen, regard being had to the prevailing winter winds in making a choice. If the run, as well as the house, can be roofed over, the benefit to the birds in the winter, by reason of the dry shelter afforded, will amply repay any extra outlay. Wood, reed, thatch, tarred felt or (if none of these can be obtained conveniently), corrugated iron may be used as a roofing material.

BRONZE TURKEY.

All the ashes available should be sifted into the house and run, and these, with occasional supplies of dry earth and as much sandy grit from the roadside or stream as can be obtained, will form an excellent covering to the floor, unless it should happen to consist of brick or cement, in which case a layer of some three or four inches thick of finely sifted peat moss is desirable to maintain a proper temperature, or, in its absence, a thick covering of ashes and leaves.

Cleanliness can only be insured in small runs and houses by the daily removal of excrement, and this can be readily done by the use of a galvanized cinder shovel. To the daily use of this implement may be attributed the fact that during six years' experiments in such a space as is usually available for cottage poultry-keeping, and frequently, in the opinion of experienced poultry-keepers, far too over crowded with birds, no disease of any kind has made its appearance.

If the cleanliness necessary to profitably keep the birds, and without which it is hopeless to expect to rear them in proper health and productiveness, be observed, it will at once be seen that however extensively a village population may add to the number of poultry kept within its area, there need be no fear of an insanitary condition arising from poultry keeping. If, from neglect or any other cause, conditions should arise prejudicial to health, the sanitary inspector could be called in as in any other matter requiring his attention.

All perches should be wide and rounded on the upper side. The nests should be placed in the darkest place in the house, and both nests and perches should be easily removable, so that the houses may at any time be thoroughly cleansed.

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